PC Compatibility Card User's Manual

For 7-inch card

Apple Computer, Inc.

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Communications regulation information

FCC statement

This equipment has been tested and found to comply with the limits for a Class B digital device in accordance with the specifications in Part 15 of FCC rules. See instructions if interference to radio or television reception is suspected.

Radio and television interference

The equipment described in this manual generates, uses, and can radiate radio-frequency energy. If it is not installed and used properly—that is, in strict accordance with Apple's instructions—it may cause interference with radio and television reception.

This equipment has been tested and found to comply with the limits for a Class B digital device in accordance with the specifications in Part 15 of FCC rules. These specifications are designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation.

You can determine whether your computer system is causing interference by turning it off. If the interference stops, it was probably caused by the computer or one of the peripheral devices.

If your computer system does cause interference to radio or television reception, try to correct the interference by using one or more of the following measures:

- Turn the television or radio antenna until the interference stops.
- Move the computer to one side or the other of the television or radio.
- Move the computer farther away from the television or radio.
- Plug the computer into an outlet that is on a different circuit from the television or radio. (That is, make certain the computer and the television or radio are on circuits controlled by different circuit breakers or fuses.)

If necessary, consult an Apple-authorized service provider or Apple. See the service and support information that came with your Apple product. Or, consult an experienced radio/television technician for additional suggestions.

IMPORTANT Changes or modifications to this product not authorized by Apple Computer, Inc., could void the FCC Certification and negate your authority to operate the product.

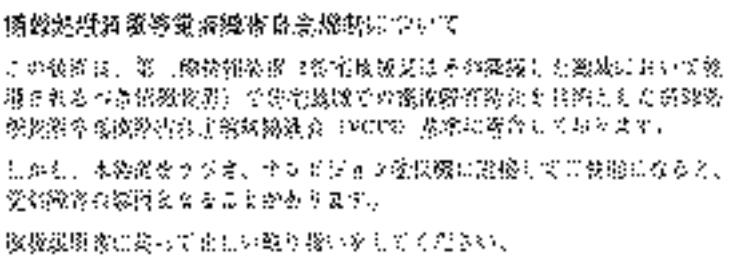
This product was tested for FCC compliance under conditions that included the use of Apple peripheral devices and Apple shielded cables and connectors between system components. It is important that you use Apple peripheral devices and shielded cables and connectors between system components to reduce the possibility of causing interference to radios, television sets, and other electronic devices. You can obtain Apple peripheral devices and the proper shielded cables and connectors through an Apple-authorized dealer. For non-Apple peripheral devices, contact the manufacturer or dealer for assistance.

DOC statement

DOC Class B Compliance This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus as set out in the interference-causing equipment standard entitled “Digital Apparatus,” ICES-003 of the Department of Communications.

Observation des normes—Classe B Cet appareil numérique respecte les limites de bruits radioélectriques applicables aux appareils numériques de Classe B prescrites dans la norme sur le matériel brouilleur : “Appareils Numériques”, NMB-003 édictée par le ministre des Communications.

VCCI statement



Preface

The PC Compatibility Card lets you use DOS, Windows 3.1, Windows 3.11, Windows for Workgroups, and Windows 95 applications directly on your Macintosh computer. It includes a high-performance microprocessor that's compatible with the latest DOS and Windows software. You can:

- simultaneously run the Macintosh operating system (Mac OS) and PC applications
- switch between the Mac OS and PC environments at any time without quitting the applications you're using
- view the current environment on a single monitor, or view both environments simultaneously on two monitors
- use the same hard disk for both Mac OS and PC software
- use your Macintosh keyboard and one-button or multibutton Apple Desktop Bus (ADB)–compatible mouse with PC software
- use your Macintosh modem, monitor, and printer with PC software, or connect PC-compatible equipment
- with some models, use a joystick or other game controller with PC applications
- with some models, connect MIDI equipment
- add random-access memory (RAM) to the PC Compatibility Card
- use the built-in Macintosh serial ports with PC software

- with some models, play and record from PC CD-ROM discs using an Apple CD-ROM drive
- copy and paste data between Mac OS and PC documents
- with some models, play Sound Blaster–compatible sounds and use Sound Blaster sound processing utilities
- communicate with network servers and other computers running PC software

About this manual

This manual describes how to install your PC Compatibility Card, how to connect additional equipment, how to install the software that came with your PC Compatibility Card, and how to work with the PC and Mac OS environments.

To set up your card, follow these steps:

- To install your card, turn to the chapter for the kind of computer you have.
- To connect additional equipment, turn to Chapter 3, “Connecting Monitors and Other Equipment.”

To install and begin using your software, follow these steps:

- To install your software, turn to Chapter 4, “Installing the PC Compatibility Card Software.”
- To learn how to configure your software, turn to Chapter 5, “Setting Up the PC Environment.”
- To learn how to work with the PC and Mac OS environments, turn to Chapter 6, “Working in the PC Environment.”
- To solve problems that may occur while you’re using your PC-compatible Macintosh, turn to Chapter 7, “Troubleshooting in the PC Environment.”

1 Installing the Card in a Power Macintosh 7200, 7500, or 7600

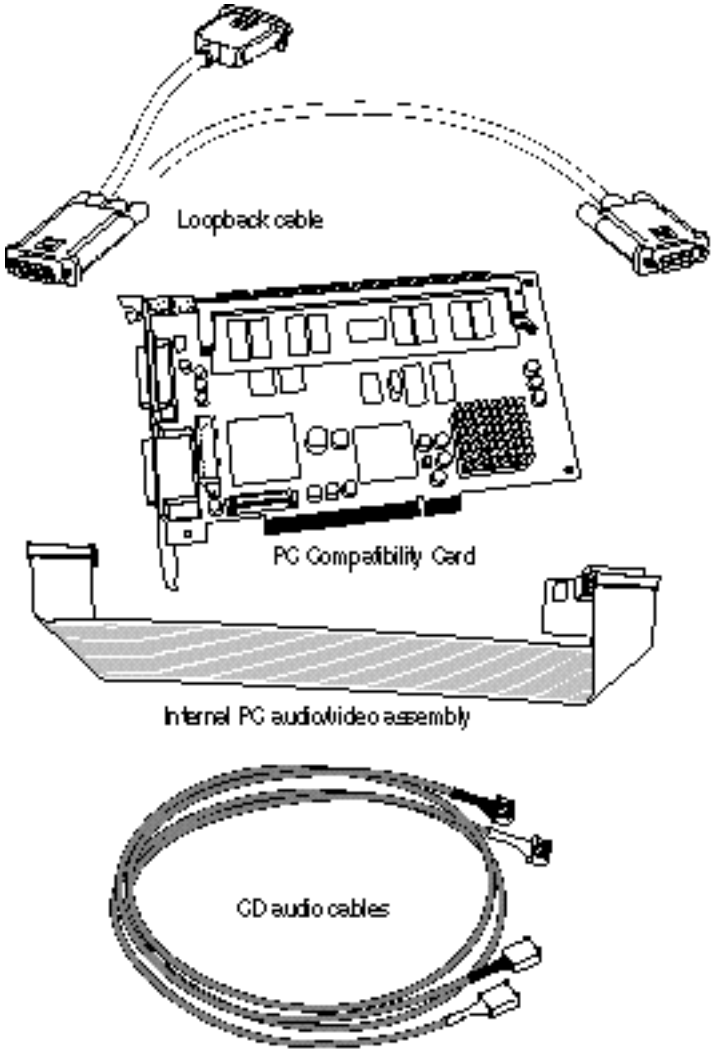
This chapter describes how to install the PC Compatibility Card hardware in a Power Macintosh 7200, 7500, or 7600.

IMPORTANT If you received this manual with a computer, the PC Compatibility Card hardware is already installed. Go to Chapter 3, "Connecting Monitors and Other Equipment." If you want to install additional memory in your card, go to Appendix A, "Adding Memory to a PC Compatibility Card." Then turn to Chapters 4 through 7 to learn more about installing and using PC software.

What you need

Before beginning the installation process, make sure you have all the necessary parts: the PC Compatibility Card, internal PC audio/video assembly (Power Macintosh 7200 models only), two CD audio cables, and the loopback cable.

Note: You need only the parts noted here for this installation. (Any additional included parts are for installing the PC Compatibility Card in other Macintosh models.)



Installing the PC Compatibility Card hardware

WARNING The installation of the PC Compatibility Card is technically complex. Unless you are comfortable installing components inside computers, Apple recommends that you have the PC Compatibility Card installed by your Apple-authorized dealer (for a fee).

To avoid damaging the computer and the card, do not attempt to install the card, install memory, or connect the cables without first reading this documentation.

There are several steps to installing your PC Compatibility Card hardware:

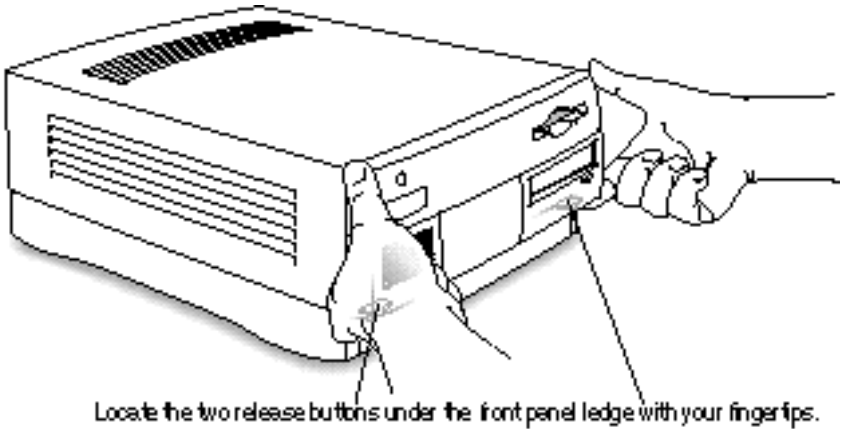
- removing the computer's case
- disconnecting the CD audio cable from the CD-ROM drive
- opening the computer's expansion card cover and chassis
- connecting the internal PC audio/video assembly (Power Macintosh 7200 models only) and installing the card
- connecting the CD audio cables to the card and the logic board
- closing the chassis
- connecting the new CD audio cable to the CD-ROM drive
- replacing the computer's case

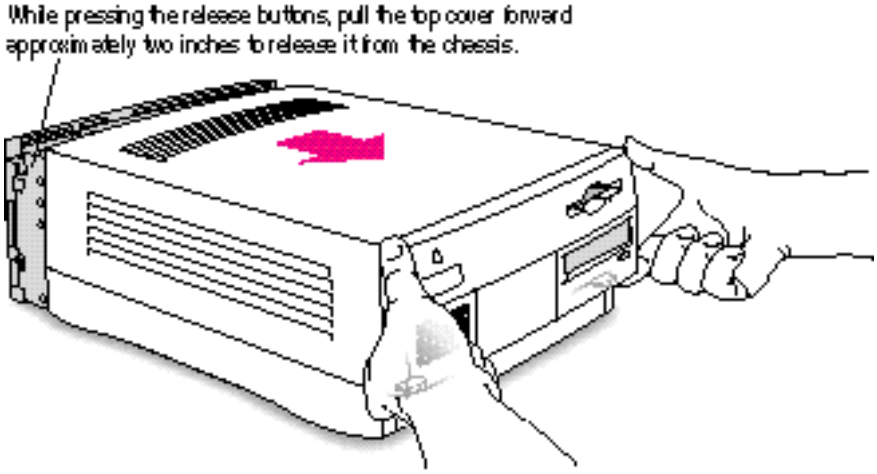
Removing the computer's case

1 **Shut down the computer.**

Leave the computer plugged in to ground it and protect its components from static electricity damage.

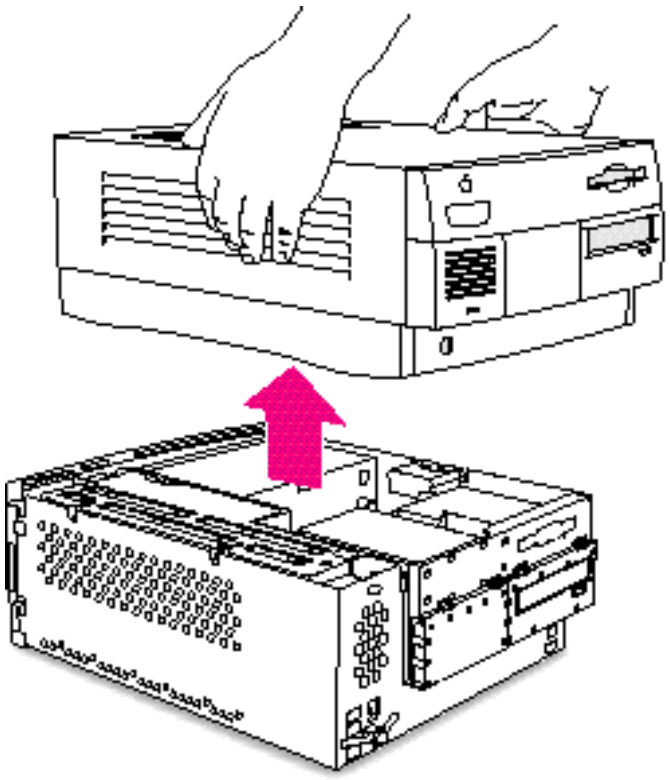
2 **Press the two release buttons under the front panel and slide the cover toward you approximately two inches.**





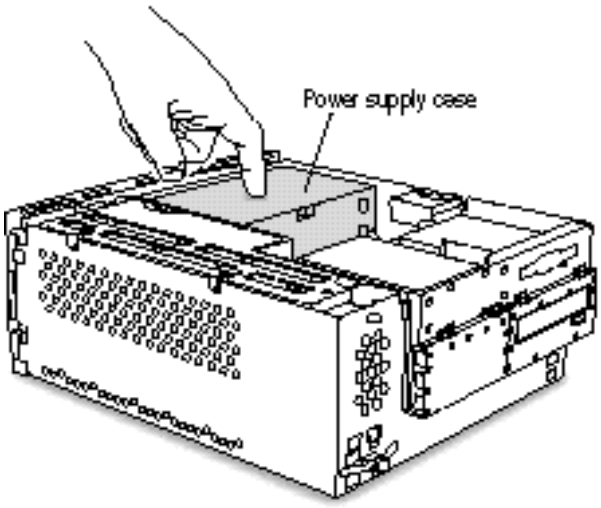
3 Remove the cover from the computer.

After you've slid the cover forward about two inches, lift it straight up and off the computer.



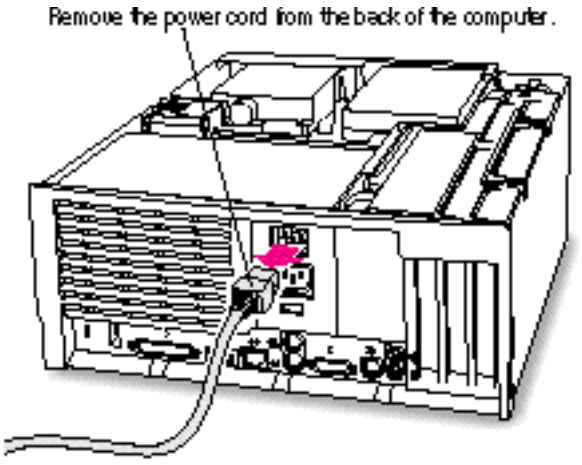
4 **Touch the metal part of the power supply case inside the computer to discharge static electricity.**

Always do this before you touch any parts, or install any components, inside the computer.



5 **Unplug the power cord from the computer's back panel.**

You need to unplug the power cord because you'll be lifting the computer chassis in steps 10–12.

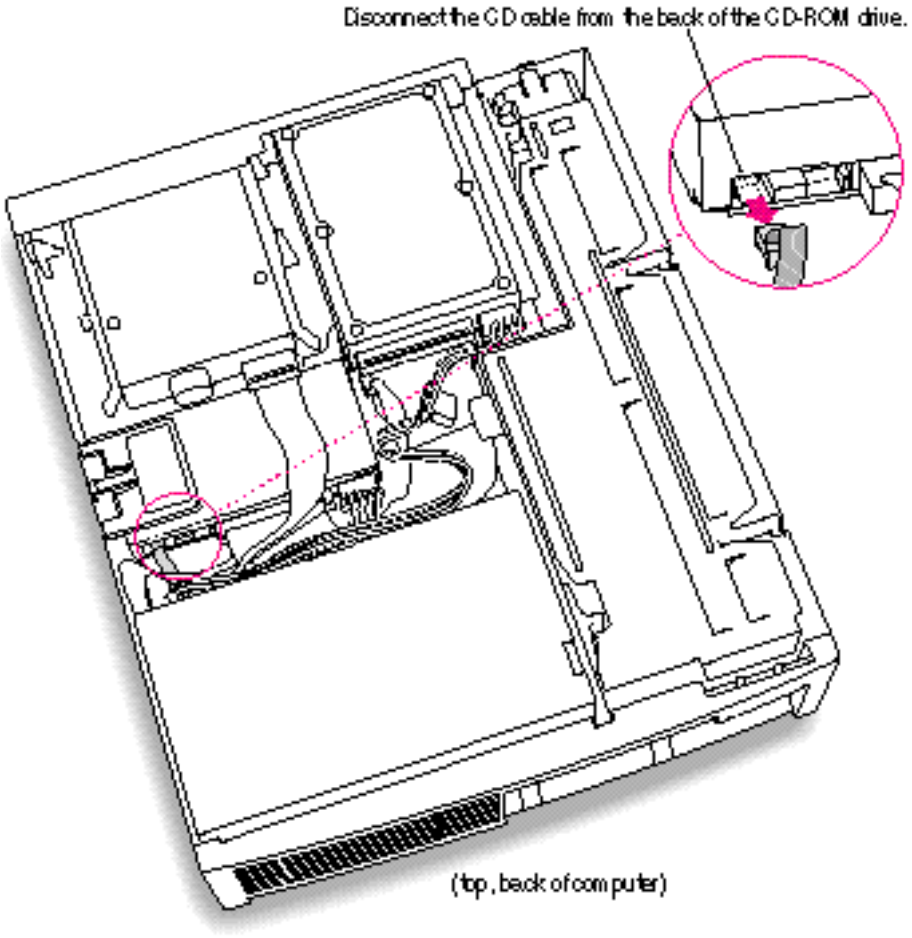


Disconnecting the CD audio cable from the CD-ROM drive

6 **Disconnect the CD audio cable from the CD-ROM drive.**

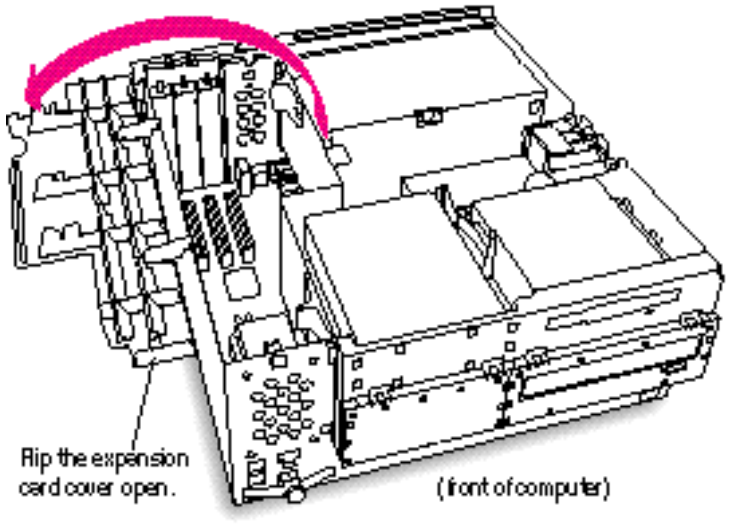
Be sure to pull the plug, not the cable.

Just disconnect this end of the cable for right now. Later you will replace this cable with the new cables included with your PC Compatibility Card.



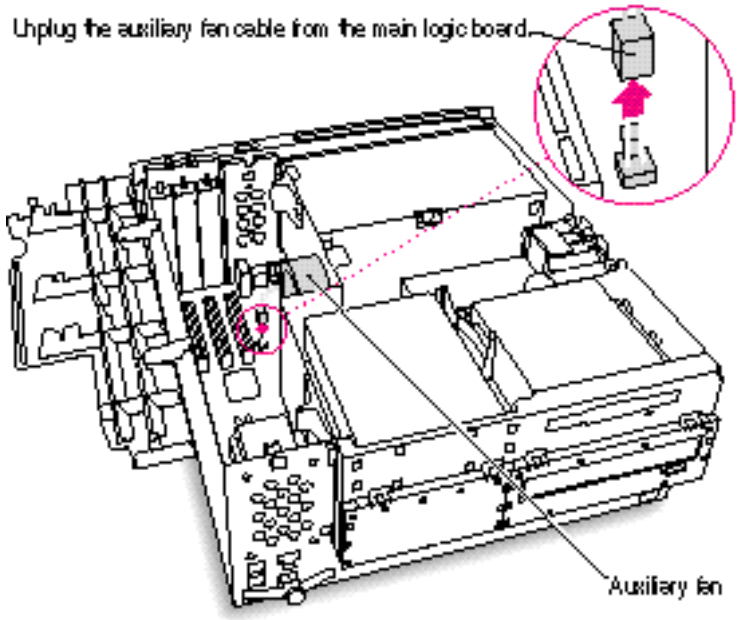
Opening the computer

7 **Flip open the expansion card cover.**



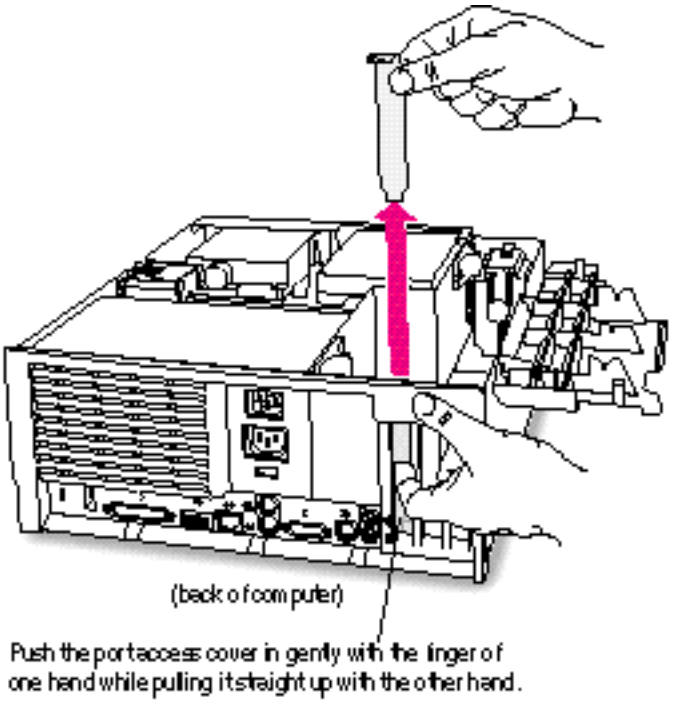
8 **If there is an auxiliary fan, disconnect the fan cable.**

Some computer models do not have a fan.



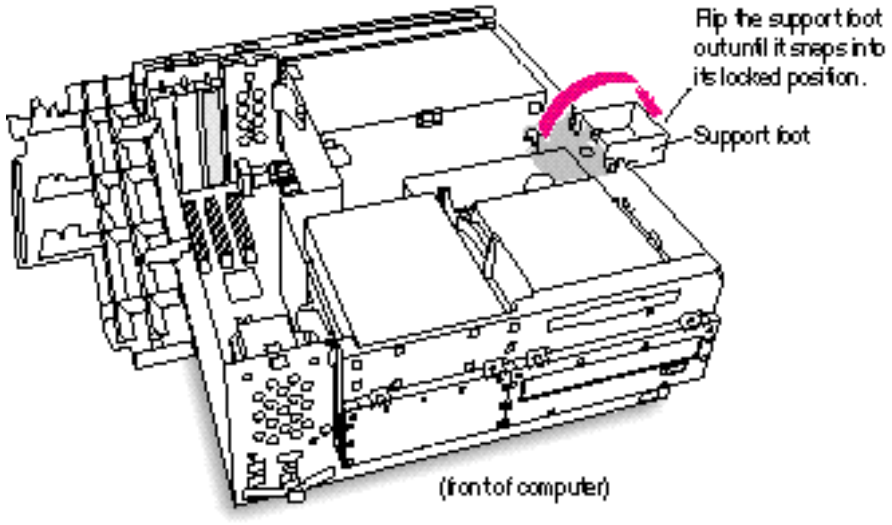
9 **Pull out the port access cover behind the first expansion slot (the one closest to the center of the computer).**

It's recommended that you install your PC Compatibility Card in the first slot (the one closest to the center of the computer). But if a card is already installed in the first slot, you can install the PC Compatibility Card in another slot.

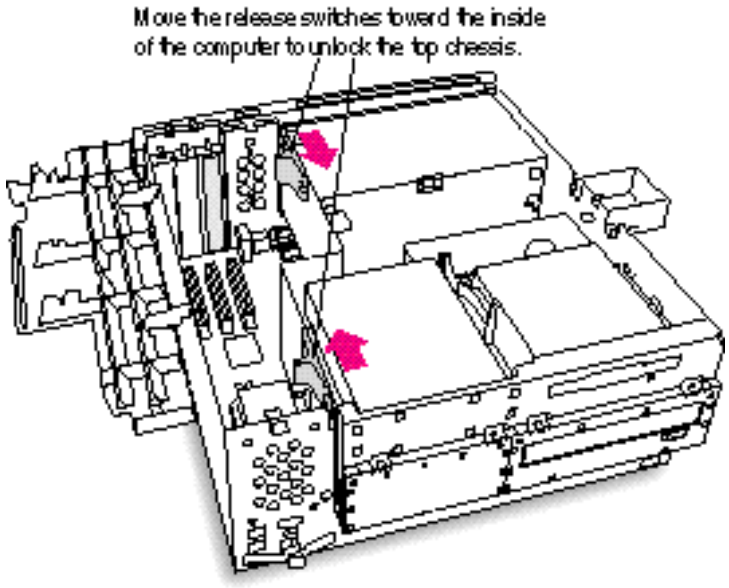


10 **Position the support foot.**

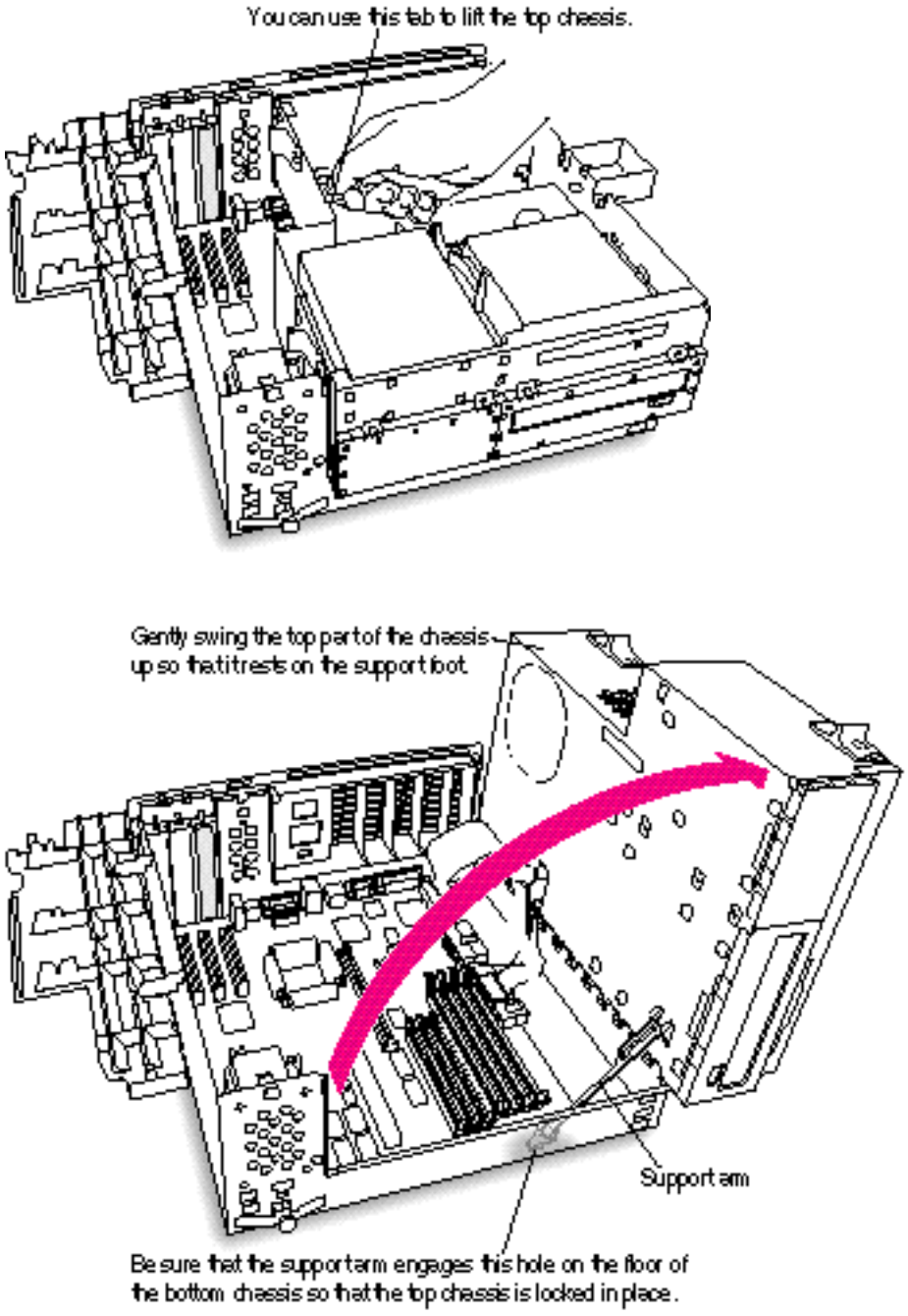
The support foot holds the computer's chassis when you open it.



11 **Unlock the chassis release switches.**



12 **Lift the chassis and rest it on the support foot. Make sure the support arm is engaged.**



What you do next depends on whether you want to add a DIMM (dual inline memory module) to your PC Compatibility Card to increase the amount of RAM available to the card. The card comes with RAM installed, but adding more memory may improve the performance of your PC applications.

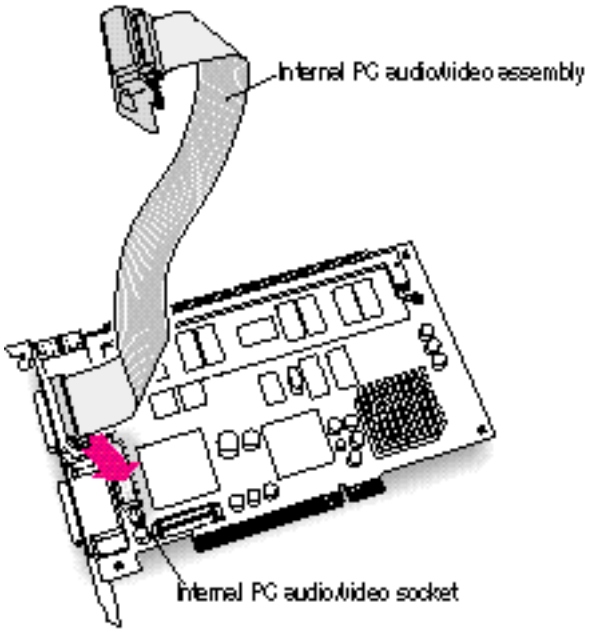
If you want to add memory to your card, turn now to Appendix A, "Adding Memory to a PC Compatibility Card." Then come back to the next section, "Connecting the Internal PC Audio/Video Assembly and Installing the Card."

If you don't want to add memory, go on to the next series of steps, "Connecting the Internal PC Audio/Video Assembly and Installing the Card."

Connecting the internal PC audio/video assembly and installing the card

13 ***(Power Macintosh 7200 only)*** **Insert the small end of the PC audio/video assembly into the socket in the corner of the PC Compatibility Card. (You will connect the other end to the computer's logic board in step 15.)**

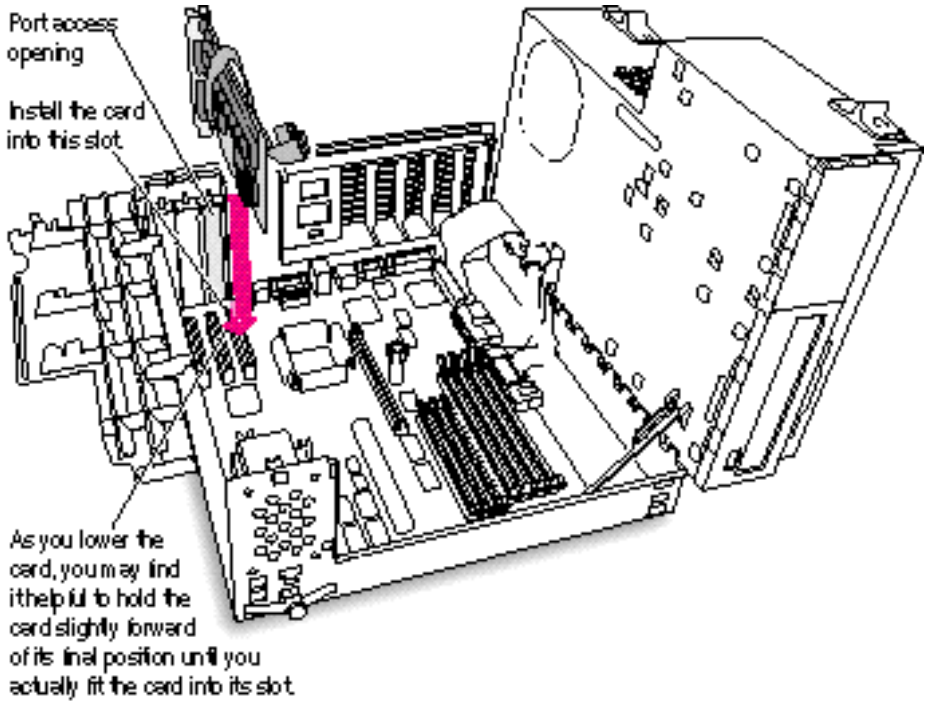
If you have a Power Macintosh 7500 or 7600, you don't need the PC audio/video assembly. Go on to the next step.



14 Insert the long connector on the bottom edge of the card into the slot whose access port cover you removed.

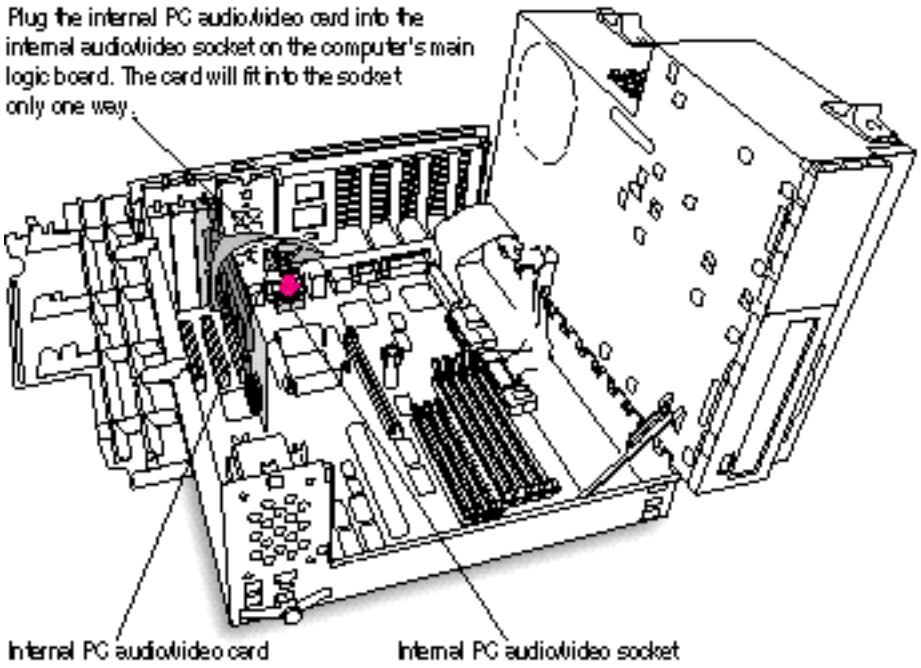
Line up the connector with the slot. The port on the card should face the port access opening on the computer's back panel. Press down firmly on the card until the connector is fully inserted. Don't force the card. If you meet a lot of resistance, pull the card out and try again.

To see if the card is connected, pull it gently. If it resists, it is connected.



15 ***(Power Macintosh 7200 only)*** **Plug the large end of the internal PC audio/video connector into the socket on the computer's main logic board.**

If you have a Power Macintosh 7500 or 7600, you don't need the PC audio/video assembly. Go on to the next step.

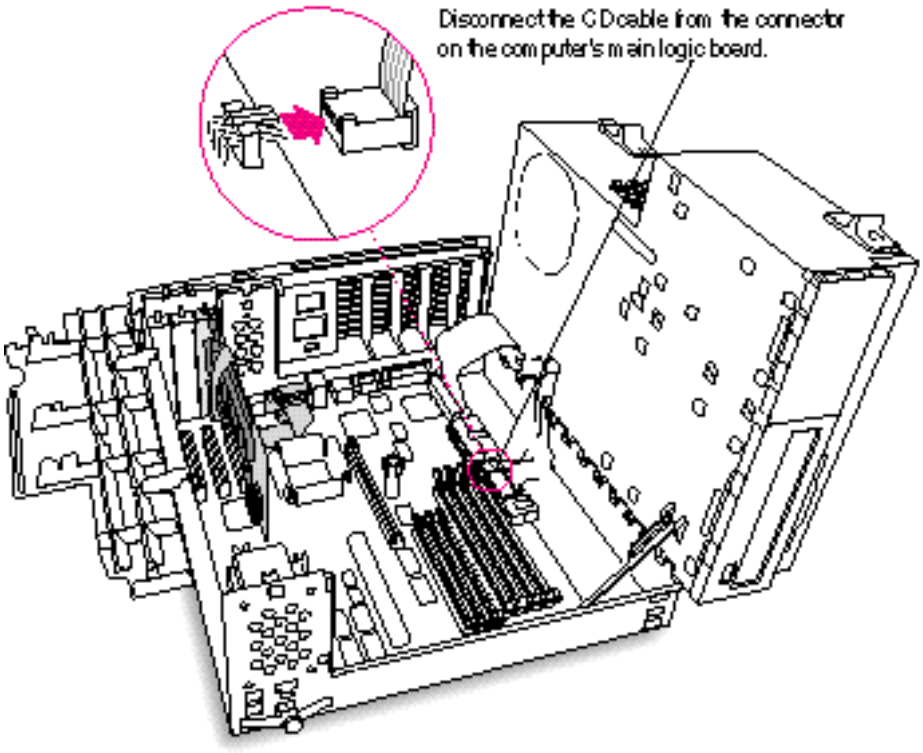


Connecting the CD audio cables to the card and the logic board

16 Disconnect the CD audio cable from the Sound In connector on the computer's logic board.

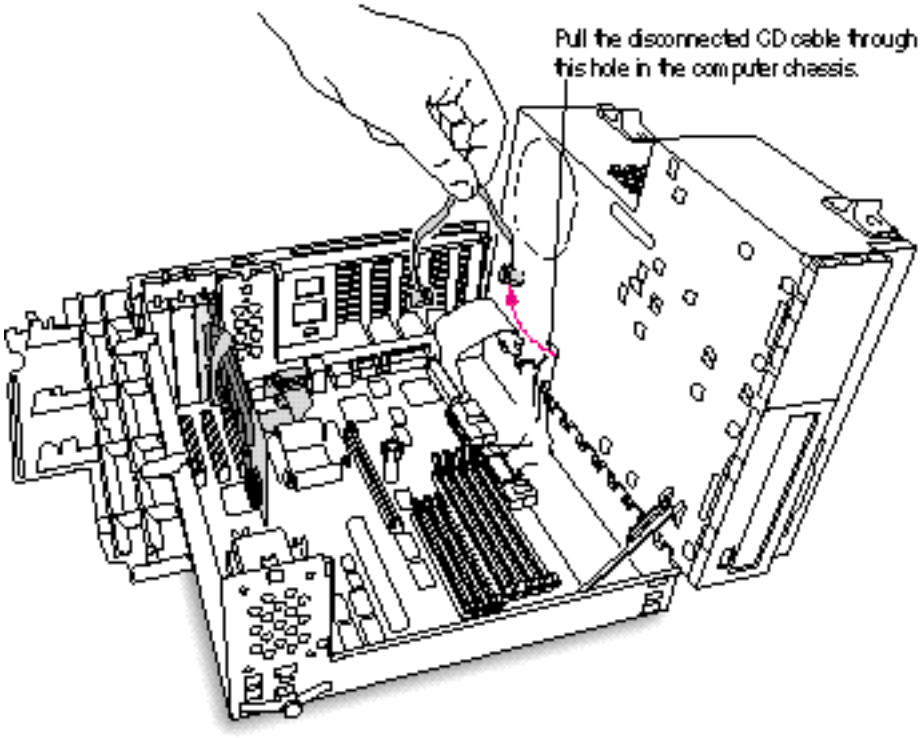
Be sure to pull the plug, not the cable.

This is the same cable you disconnected from the CD-ROM player in step 6. You will be replacing it with new cables that came with your PC Compatibility Card.



17 Pull the cable through the hole in the chassis and set it aside.

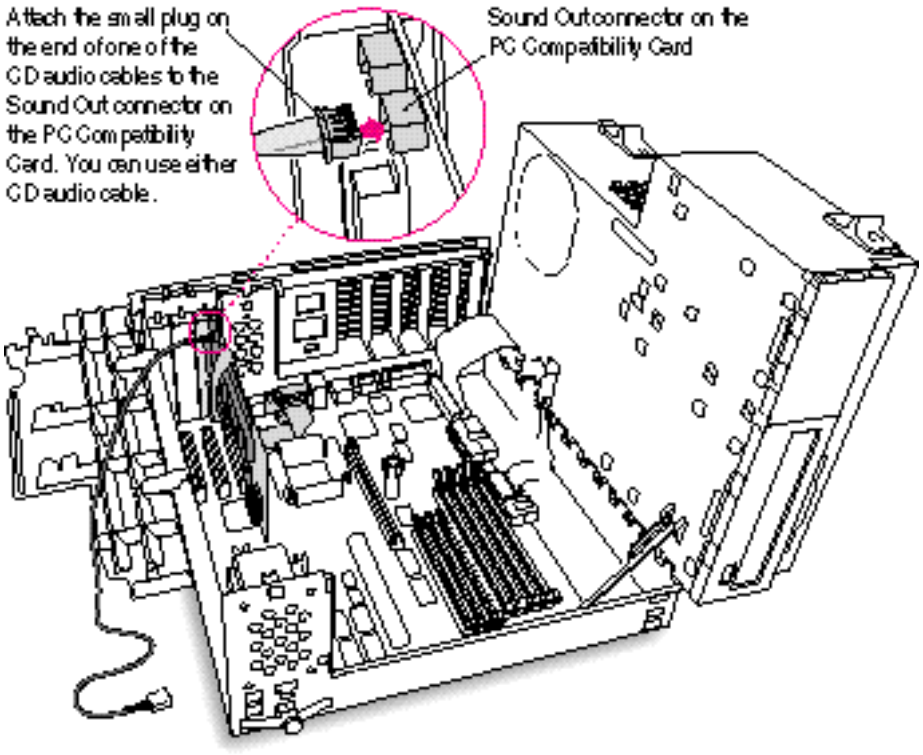
Don't force the cable. If it resists, jiggle it or feed it back through the hole and try pulling it loose again.



18 **Plug one of the CD audio cables that came with your PC Compatibility Card into the Sound Out connector on the PC Compatibility Card.**

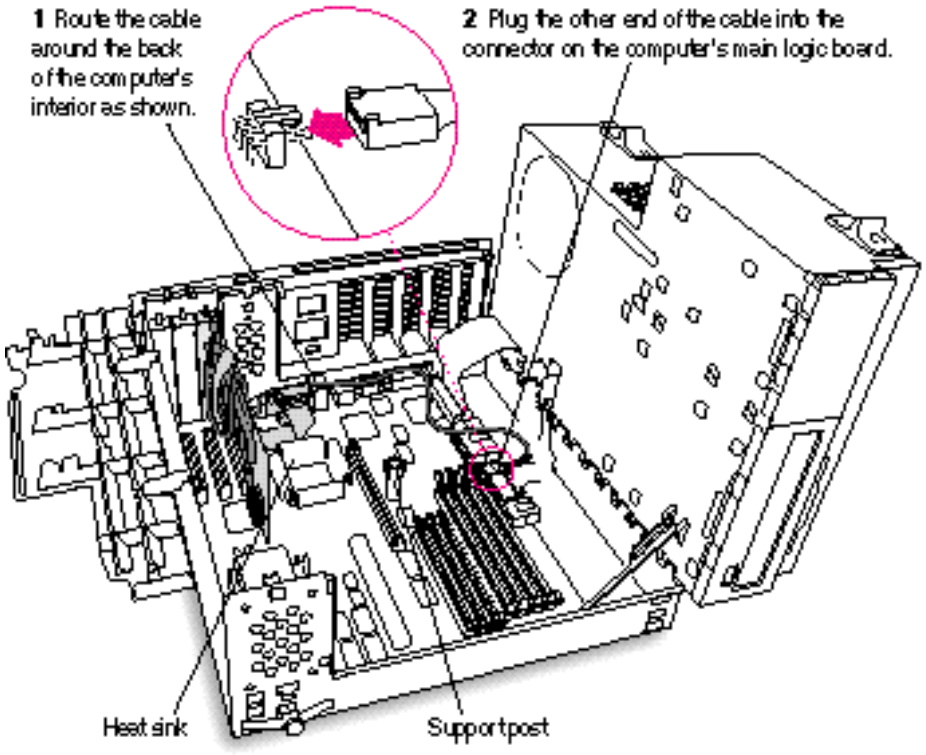
Your PC Compatibility Card came with two CD audio cables. They are different colors to make it easier to distinguish between them, but both work the same way.

The Sound Out connector is next to the CD In connector, which is at the upper-left corner of the card.

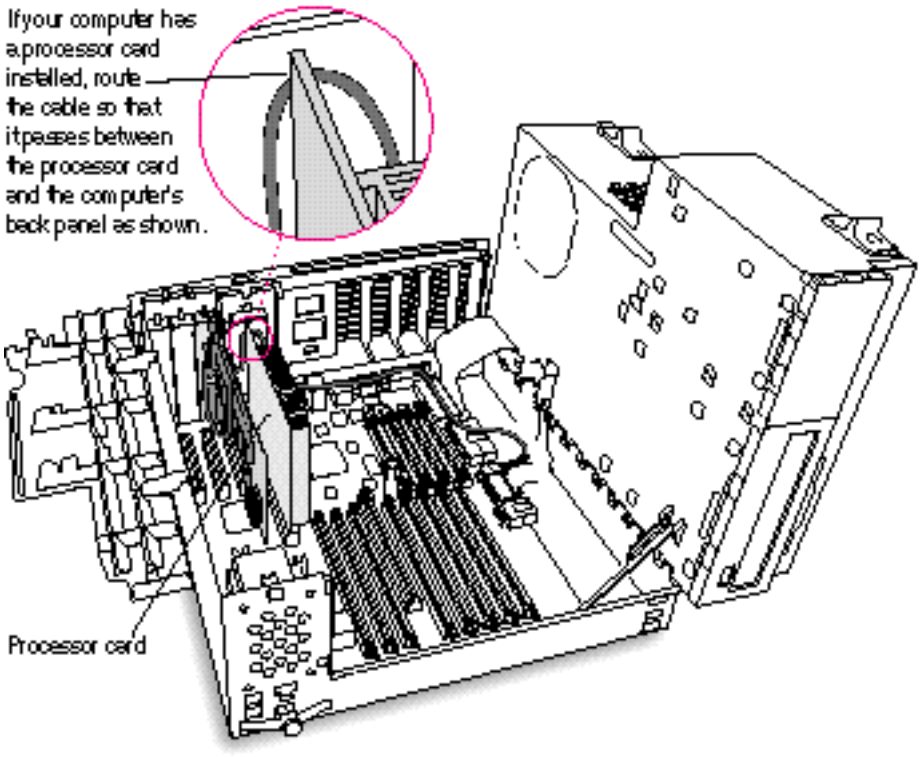


19 **Route the cable over the top of the card and around the back of the computer's logic board. Then plug it into the Sound In connector on the computer's logic board.**

Keep the cable away from the heat sink and center support post.

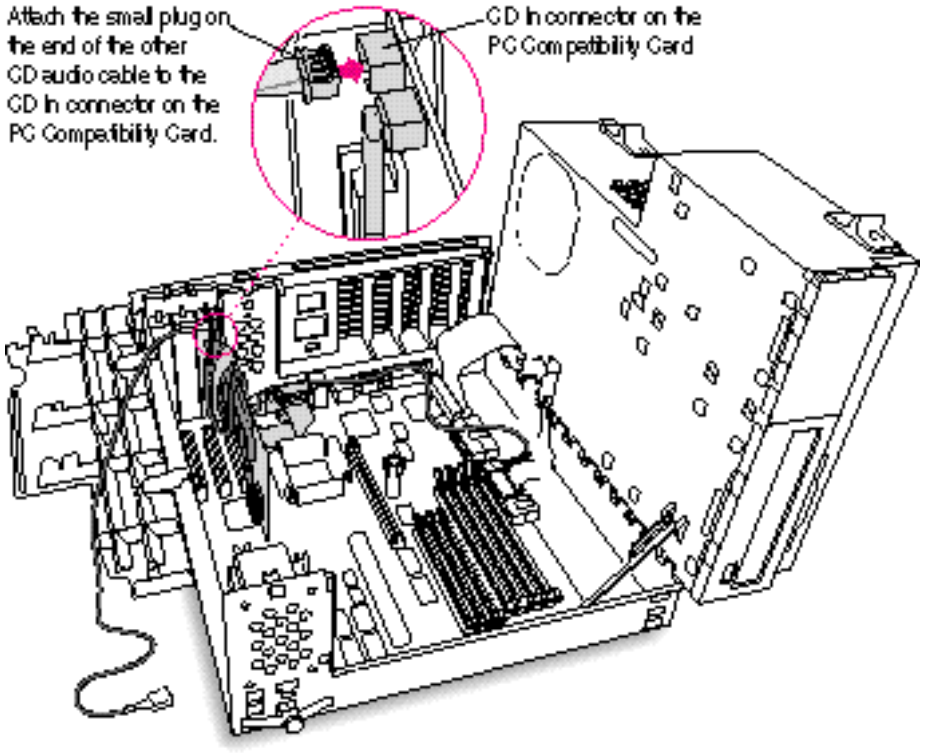


If there is a processor card in your computer, route the cable between the processor card and the back panel (not over the top of the processor card).



20 Connect the second CD audio cable to the CD In connector on your PC Compatibility Card.

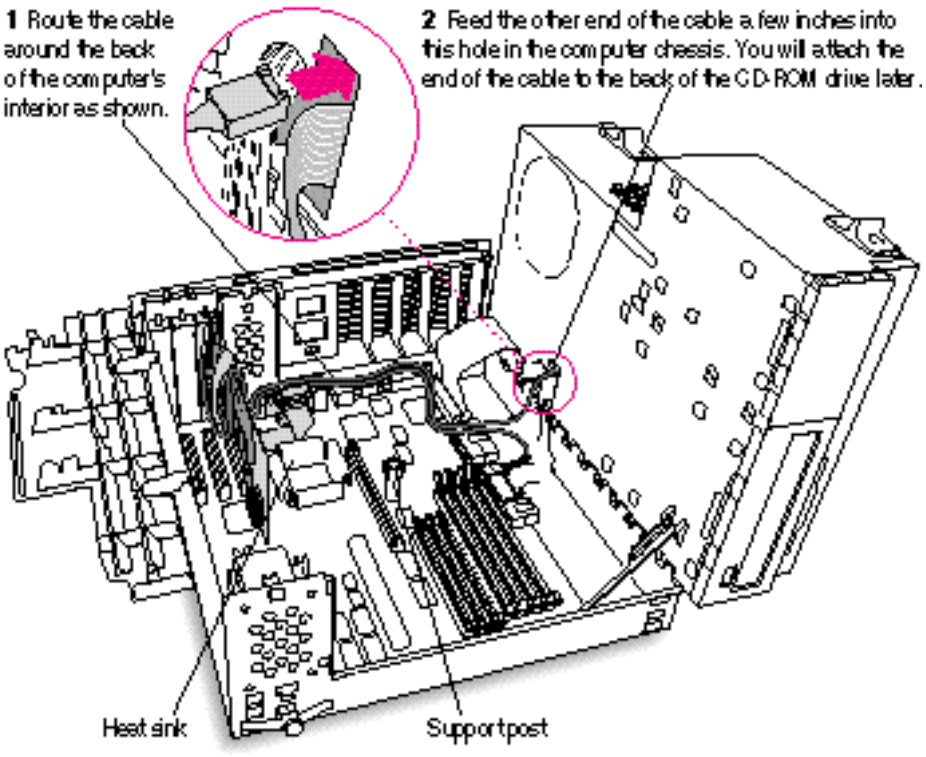
The CD In connector is in the upper-left corner of the card.



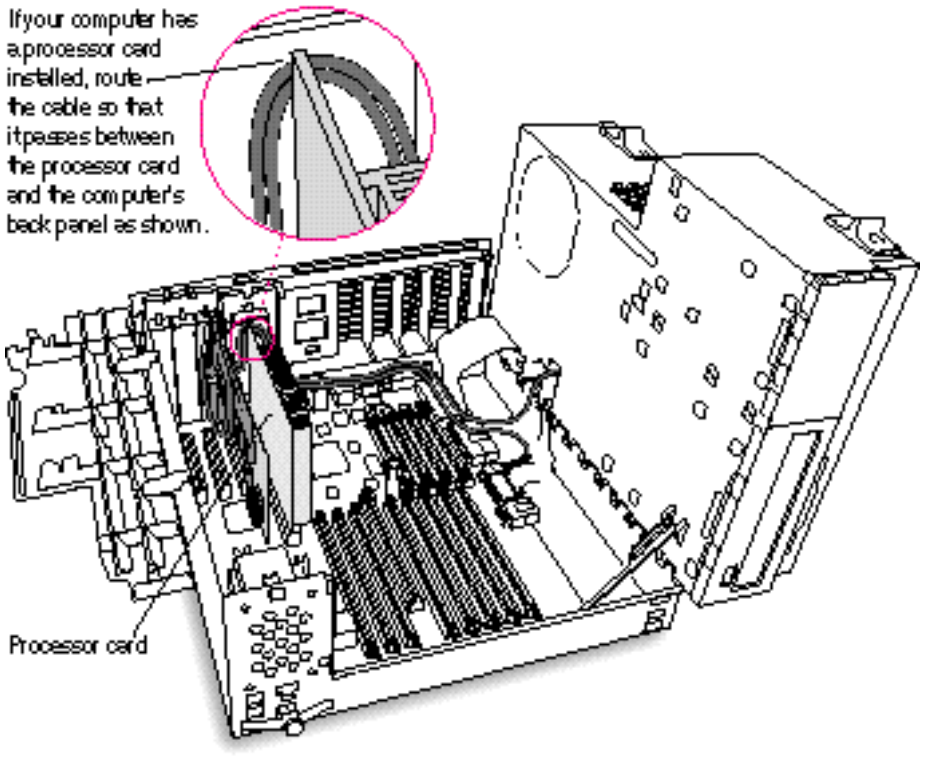
21 **Route the second cable over the top of the card, around the back of the logic board, and through the hole in the computer's chassis.**

Keep the cable away from the heat sink and the center support post.

You'll connect this cable to the CD-ROM drive in step 27.



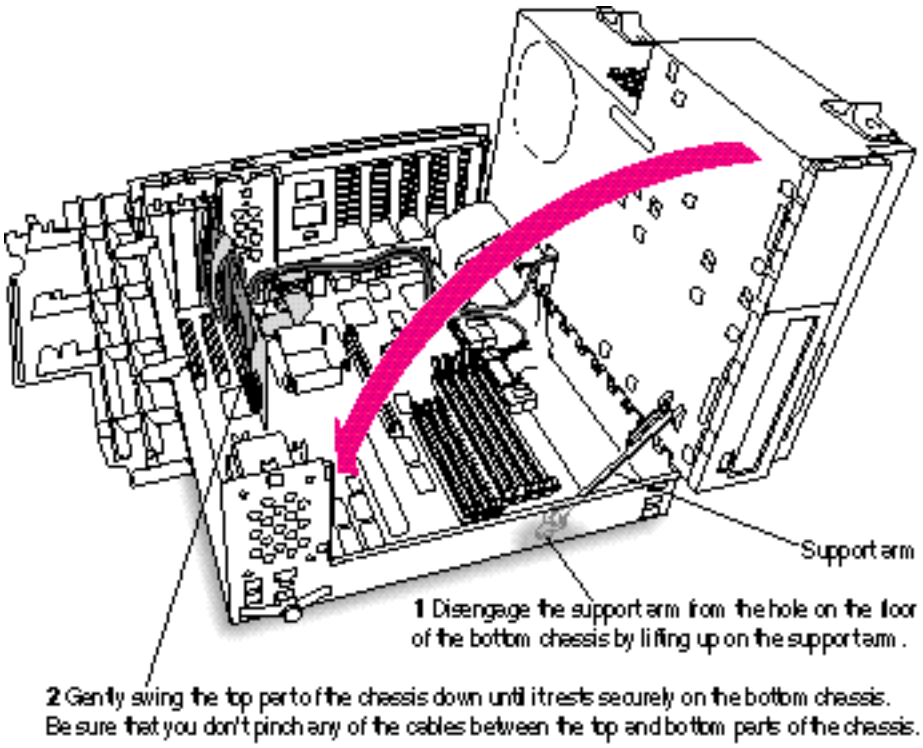
If there is a processor card in your computer, route the cable between the processor card and the back panel (not over the top of the processor card).



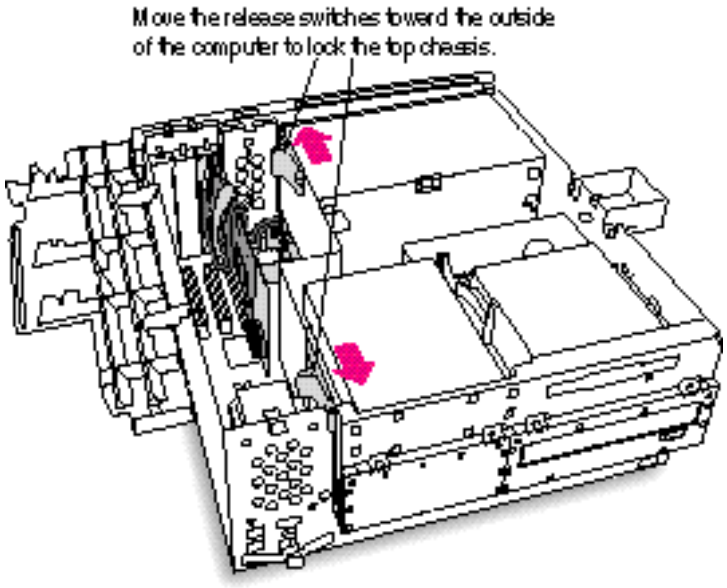
Closing the computer's chassis

22 **Close the chassis.**

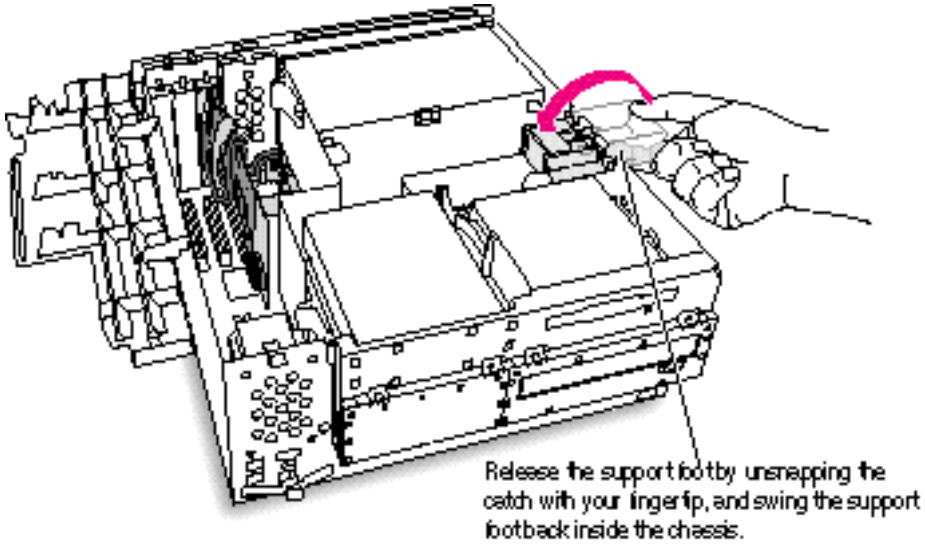
Make sure that the support arm is disengaged. Make sure the cables you connected are away from the heat sink and center support post.



23 **Lock the release switches.**

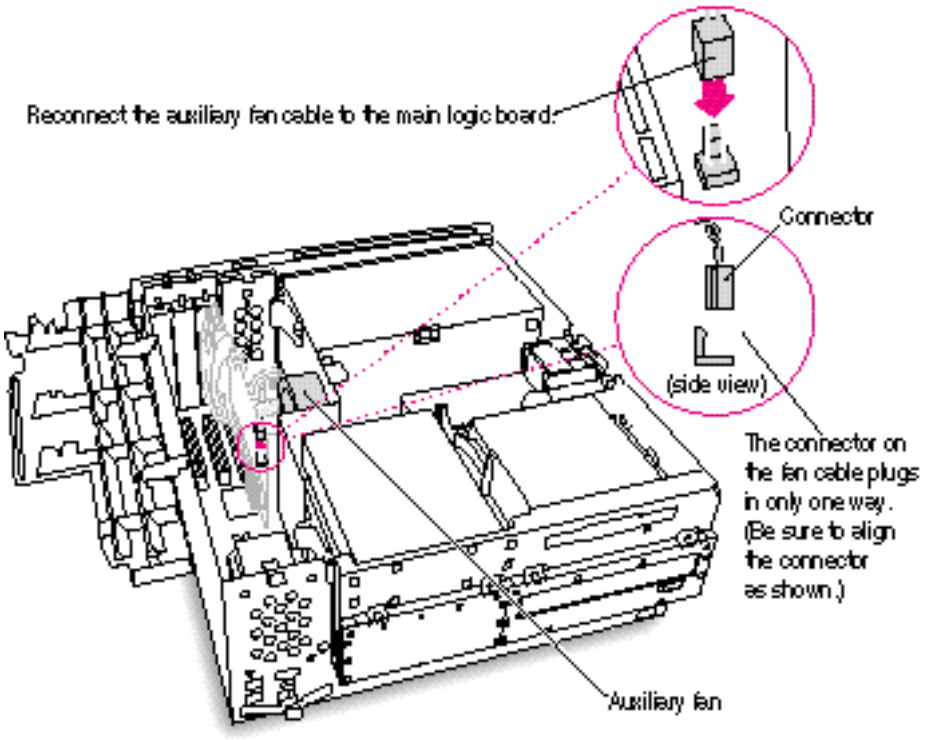


24 **Replace the support foot.**



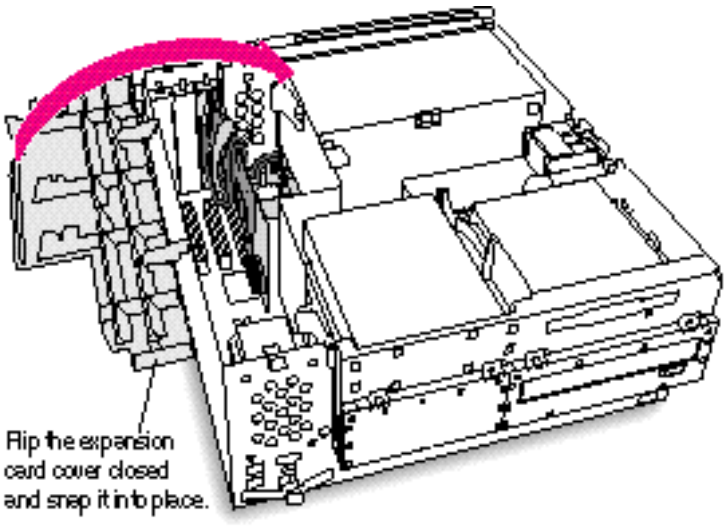
25 **If you unplugged the auxiliary fan cable, reconnect it.**

Not all computer models have an auxiliary fan.



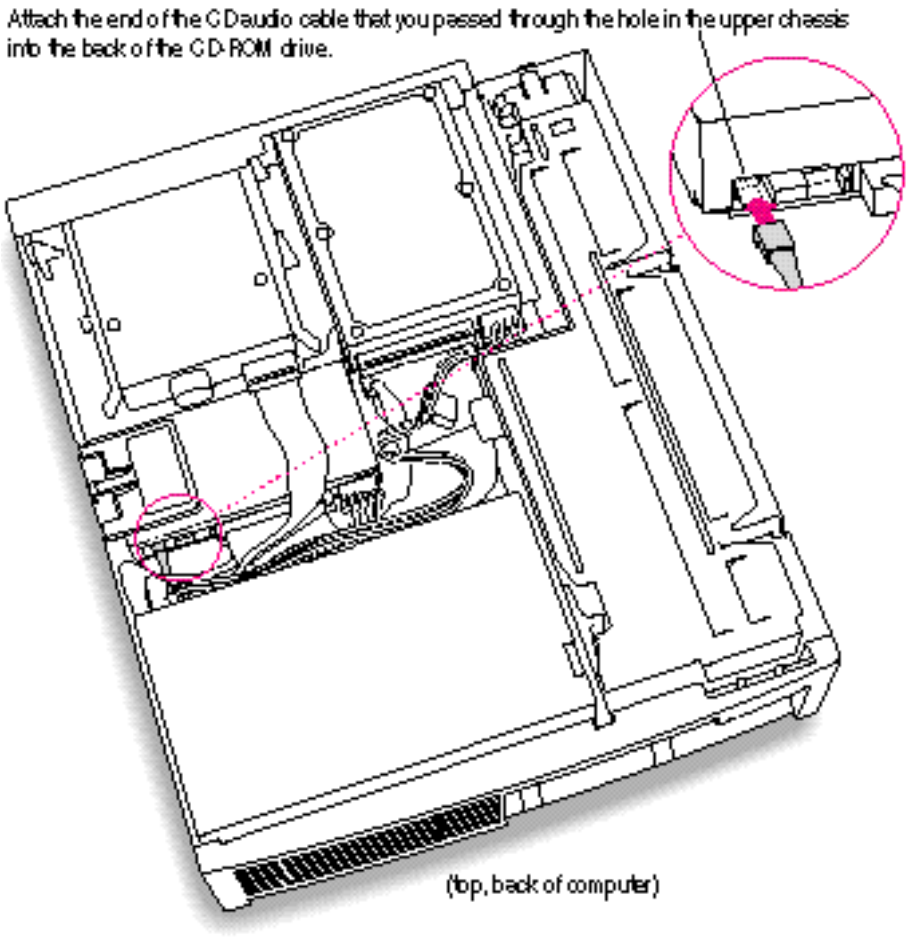
26 **Flip the expansion card cover up and snap it back into place. (Be sure to snap the cover back down on both ends.)**

If the cover doesn't snap into place easily, make sure no cables are in the way.



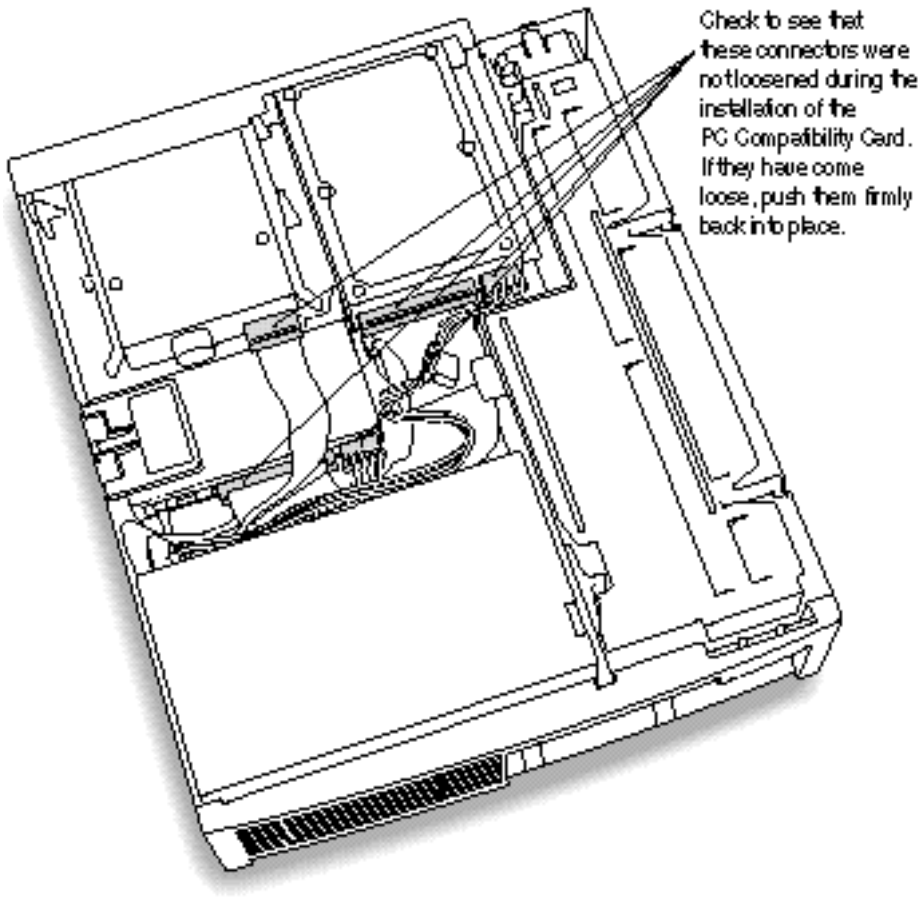
Connecting the CD audio cable to the CD-ROM drive

27 **Connect the CD-ROM cable you threaded through the computer's chassis (in step 21) to the Audio connector on the CD-ROM drive.**



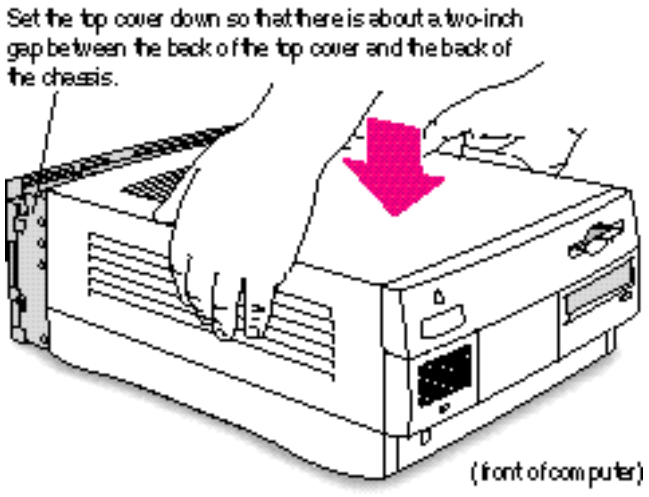
Closing the computer's case

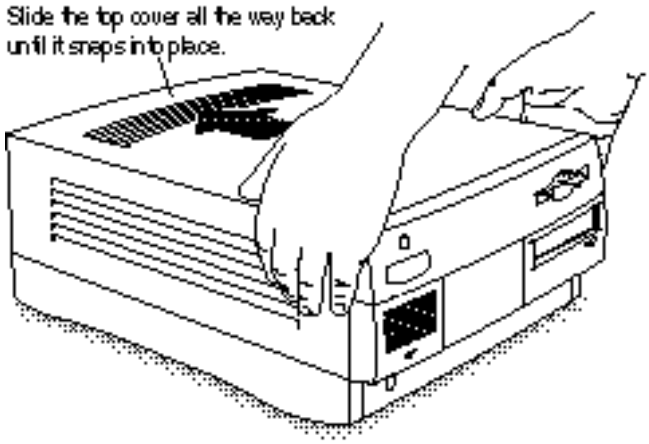
28 **Make sure all cables and cards are firmly connected.**



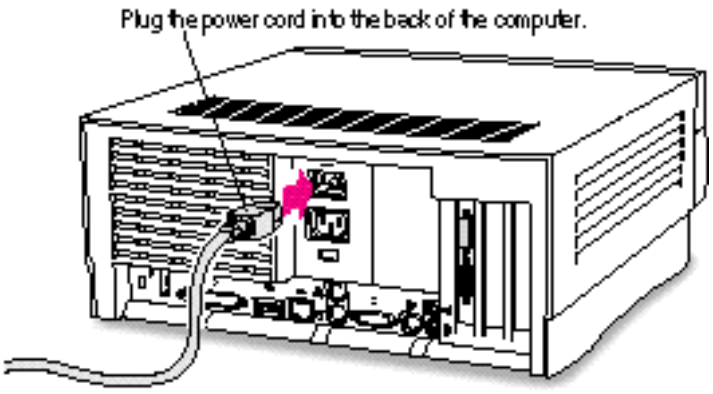
29 Replace the cover on the computer.

Lower the cover all the way down onto the case, leaving a two-inch gap. Push the cover back until it snaps into place.





30 **Plug the computer's power cord into the back panel.**



You are now finished installing the card.

What's next?

Go next to Chapter 3, "Connecting Monitors and Other Equipment."

Then go to Chapters 4 through 7 for instructions on installing and using your software.

2 Installing the Card in a Power Macintosh 8500 or 9500

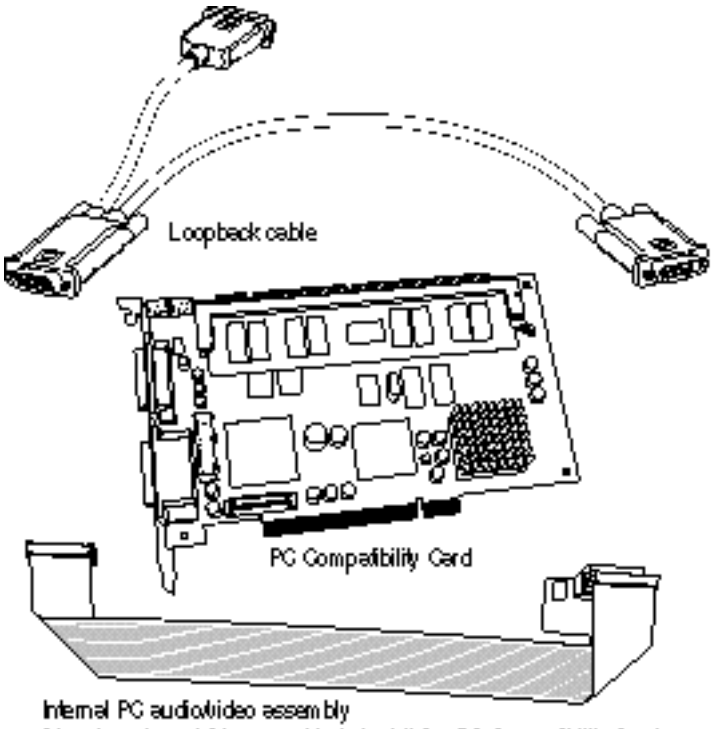
This chapter covers how to install the PC Compatibility Card hardware in a Power Macintosh 8500 or 9500.

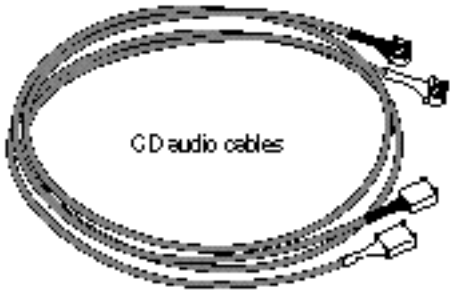
IMPORTANT If you received this manual with a computer, the PC Compatibility Card hardware is already installed. Go to Chapter 3, "Connecting Monitors and Other Equipment." If you want to install additional memory in your card, go to Appendix A, "Adding Memory to a PC Compatibility Card." Then turn to Chapters 4 through 7 to learn more about installing and using PC software.

What you need

Before beginning the installation process, make sure you have all the necessary parts: the PC Compatibility Card, two CD audio cables, and the loopback cable. You will also need a screwdriver to open the computer's case.

Note: For this installation, you need only the PC Compatibility Card, the CD audio cables, and the loopback cable. (Any additional included parts are only used for installing the PC Compatibility Card in other Macintosh models.)





Installing the PC Compatibility Card hardware

WARNING The installation of the PC Compatibility Card is technically complex. Unless you are comfortable installing components inside computers, Apple recommends that you have the PC Compatibility Card installed by your Apple-authorized dealer (for a fee).

To avoid damaging the computer and the card, do not attempt to install the card, install memory, or connect the cables without first reading this documentation.

There are several steps to installing your PC Compatibility Card hardware:

- opening the computer
- inserting the card
- connecting the CD audio cables
- closing the computer

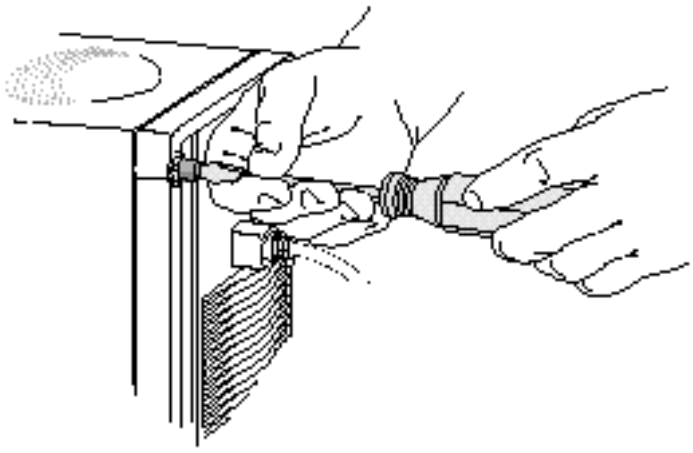
Opening the computer

1 **Shut down the computer.**

Leave the computer plugged in to ground it and protect its components from static electricity damage.

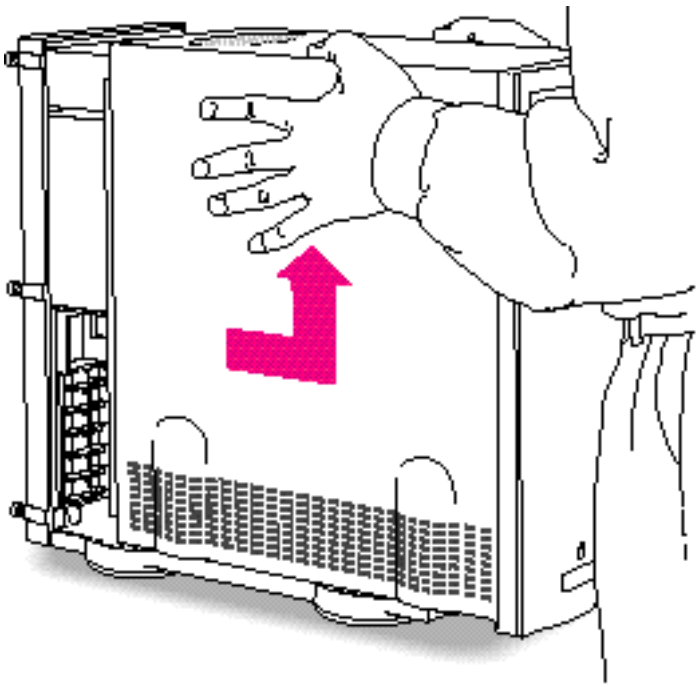
2 **Loosen the large screws on the back panel.**

If you have a Power Macintosh 8500, there are four screws, one at each corner of the back panel. If you have a Power Macintosh 9500, there are six screws (one at each corner and also two screws on the sides of the back panel). Do not completely remove the screws or the back panel.



3 Remove the cover from the computer.

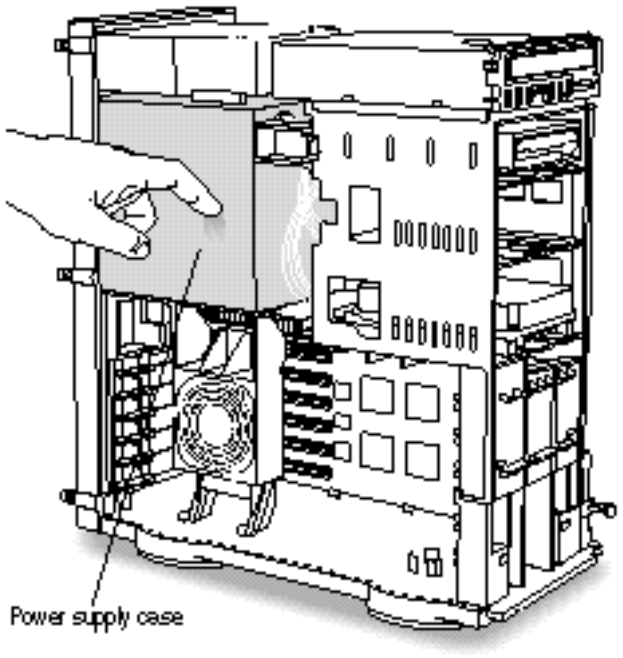
Slide the cover away from the back panel an inch or two. Then raise the cover straight up and off the computer.



4 **Touch the metal part of the power supply case inside the computer to discharge static electricity.**

Always do this before you touch any parts, or install any components, inside the computer.

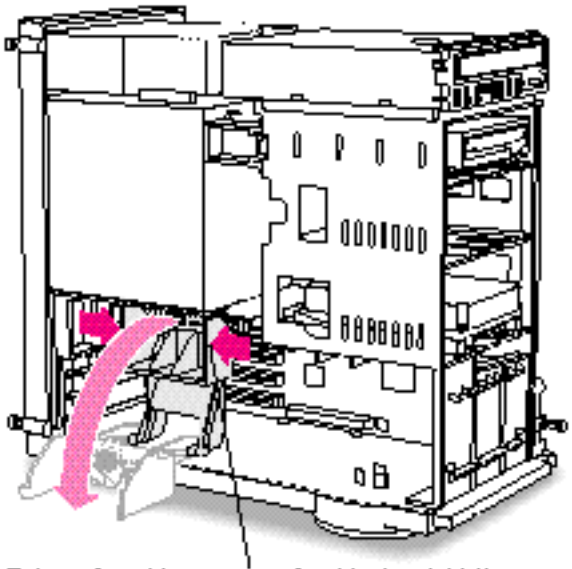
Your computer may look slightly different from the one shown.



5 Lower the retainer or auxiliary fan.

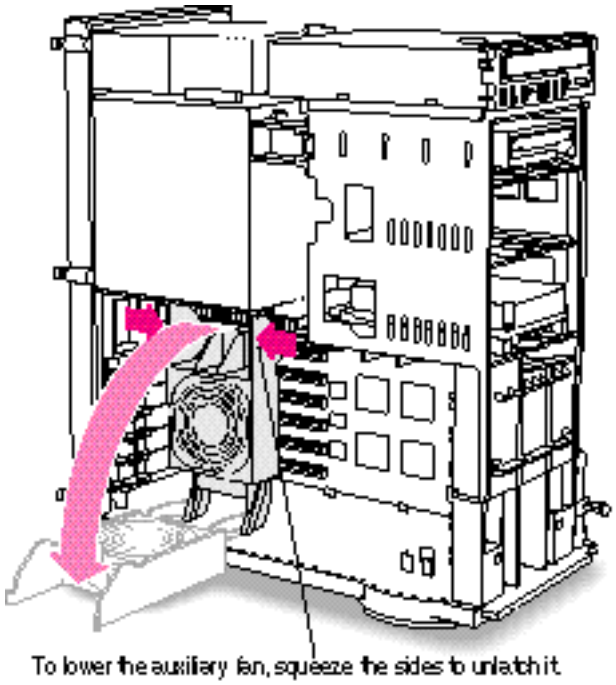
Squeeze the sides of the retainer or fan and pull down.

If you have a Power Macintosh 8500, use this illustration:



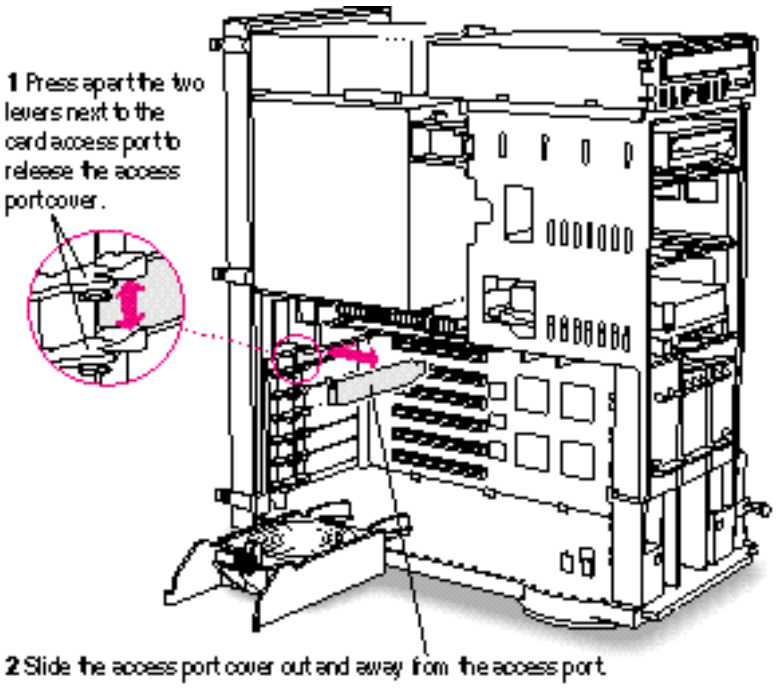
To lower the retainer, squeeze the sides to unlatch it.

If you have a Power Macintosh 9500, use this illustration:



6 **Pull out the metal access port cover behind the expansion slot closest to the center of the computer.**

It's recommended that you install your PC Compatibility Card in the first slot (the one closest to the center of the computer). But if a card is already installed in the first slot, you can install the PC Compatibility Card in another slot.



What you do next depends on whether you want to add a DIMM (dual inline memory module) to your PC Compatibility Card to increase the amount of RAM available to the card. The card comes with RAM installed, but adding more memory may improve the performance of your PC applications.

If you want to add memory to your card, turn now to Appendix A, "Adding Memory to a PC Compatibility Card." Then come back to the next section, "Installing the PC Compatibility Card."

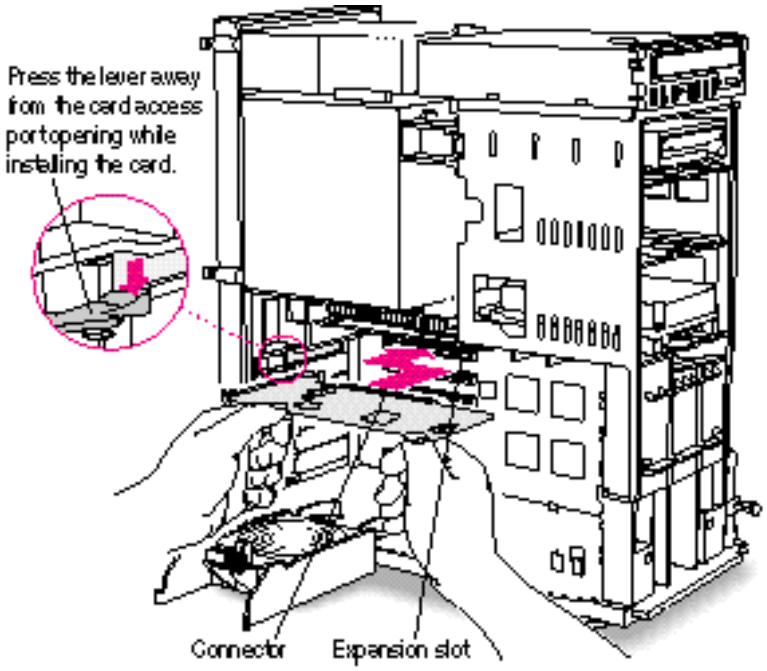
If you don't want to add memory, go on to the next section, "Installing the PC Compatibility Card."

Installing the PC Compatibility Card

7 **Insert the long connector on the bottom edge of the card into the slot behind the access port cover you removed.**

Line up the connector end of the card with the slot. The port on the card should face the port access opening on the computer's back panel. Press the lever away from the card access port and press down firmly on the card until the connector is fully inserted. Don't force the card. If you meet a lot of resistance, pull the card out and try again.

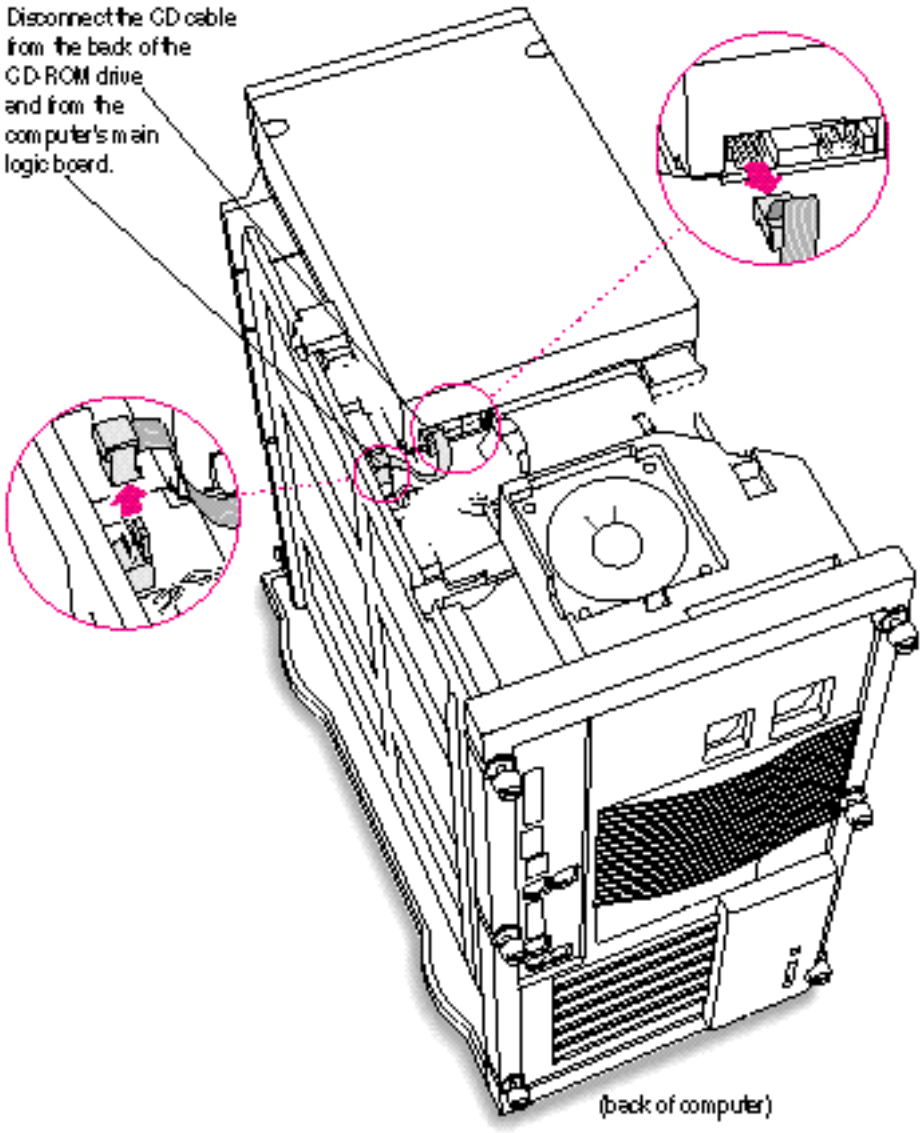
To see if the card is connected, pull it gently. If it resists, it is connected.



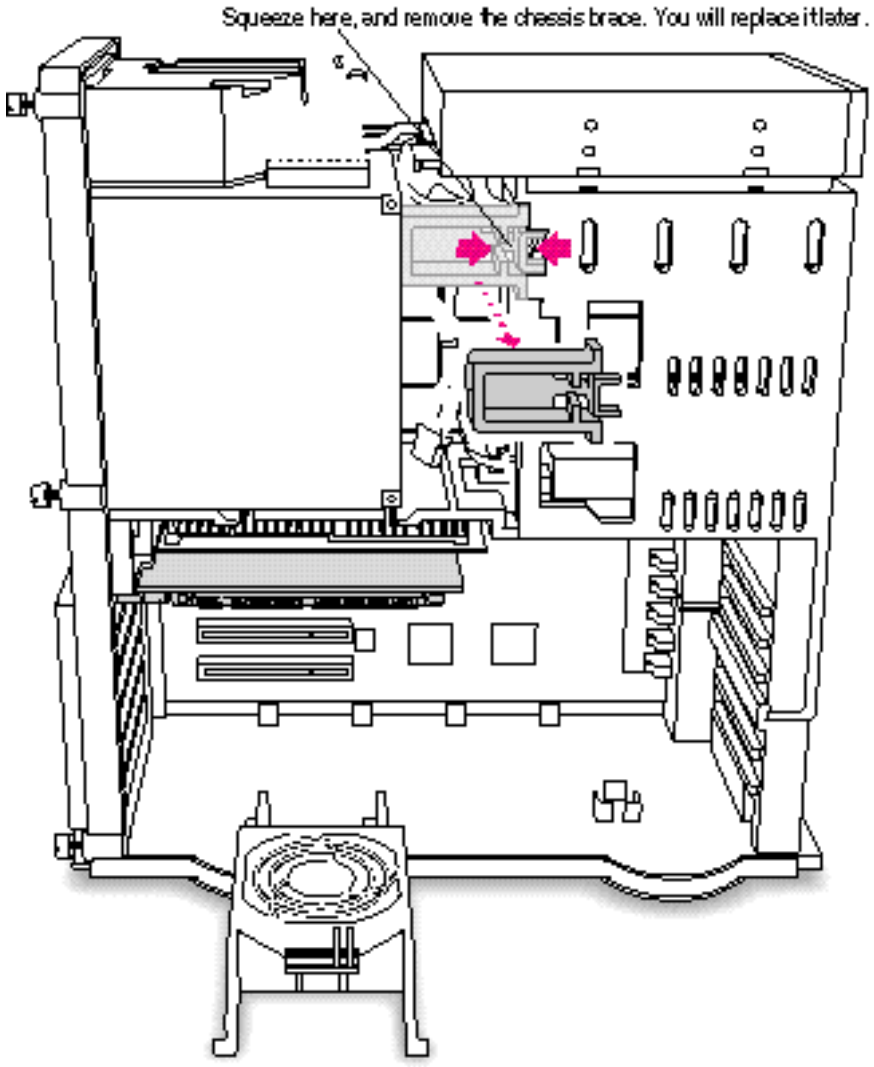
Connecting the CD audio cables

8 **Unplug the CD audio cable from the computer's logic board and the CD-ROM drive.**

You will be replacing the cable with one that came with your PC Compatibility Card.

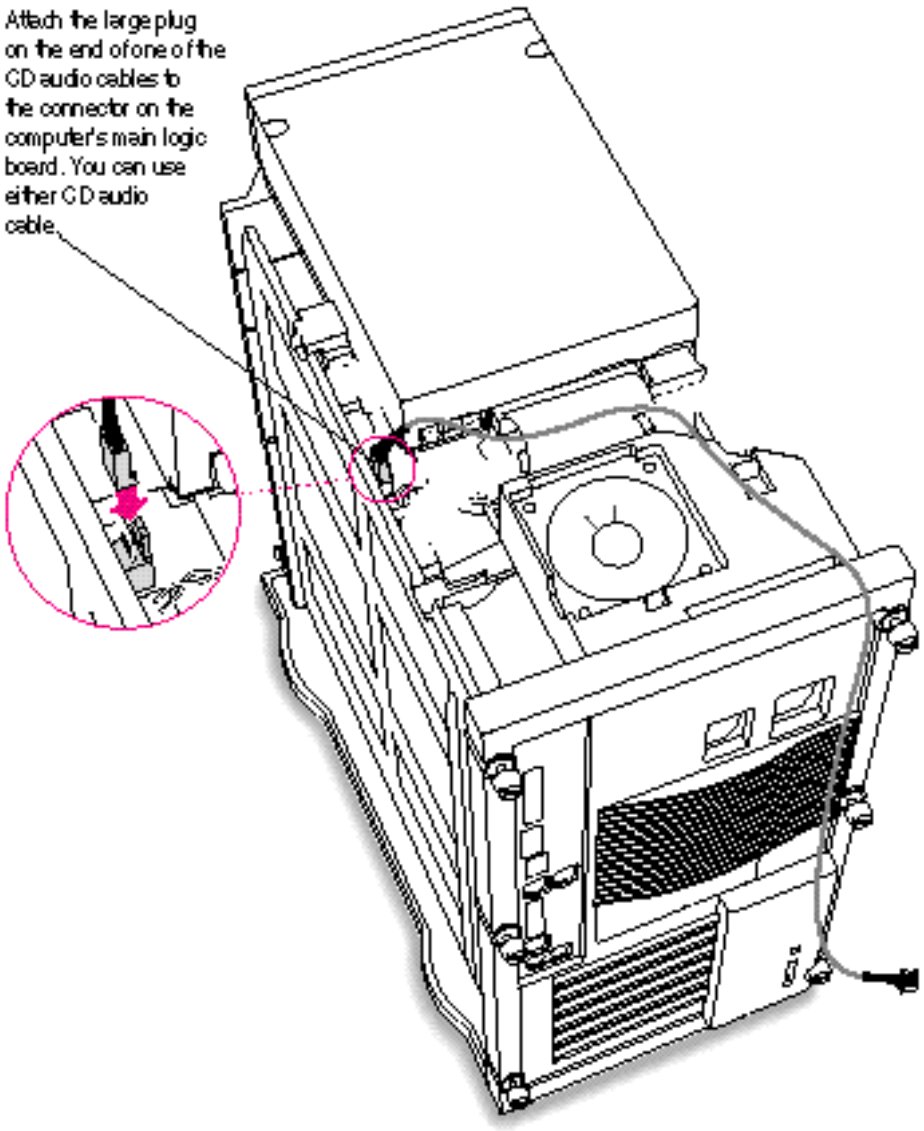


9 **Remove the chassis brace by squeezing and pulling.**

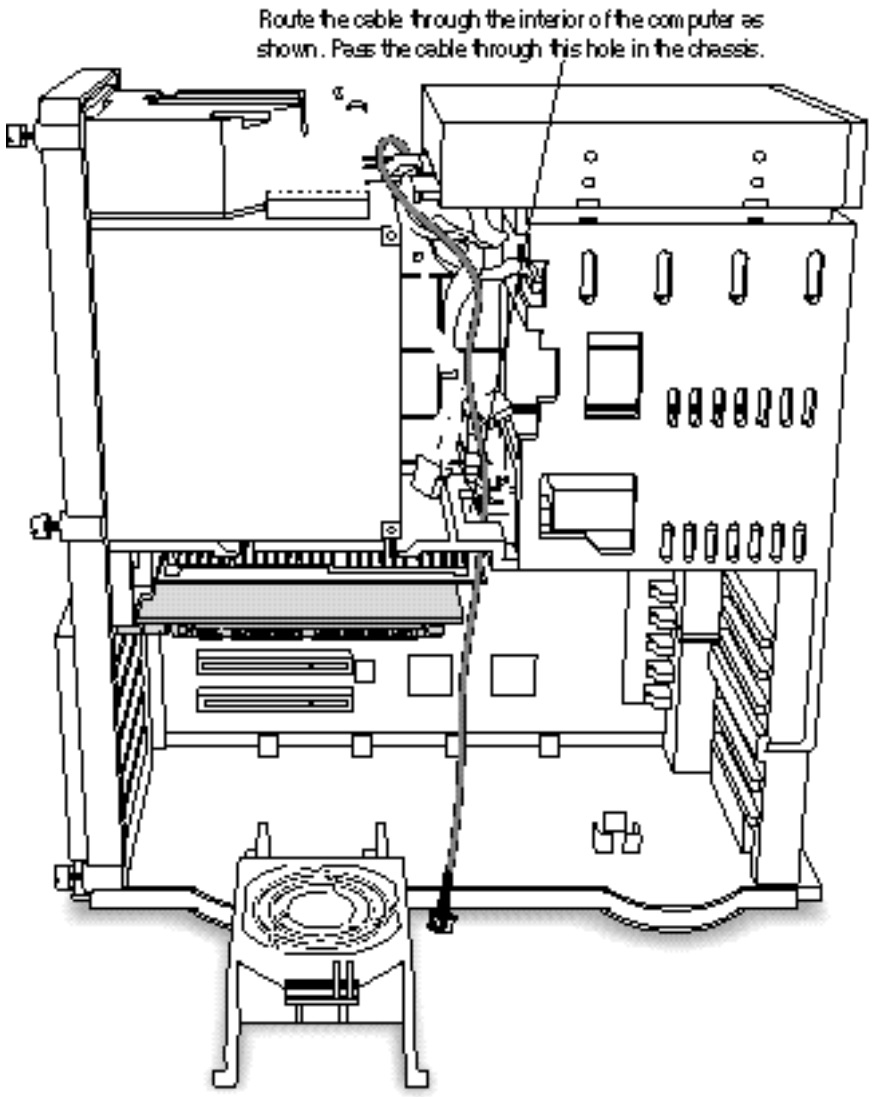


10 **Plug one of the CD audio cables that came with your PC Compatibility Card into the Sound In connector on the computer's logic board.**

Your PC Compatibility Card came with two CD audio cables. They are different colors to make it easier to distinguish between them, but both work the same way.

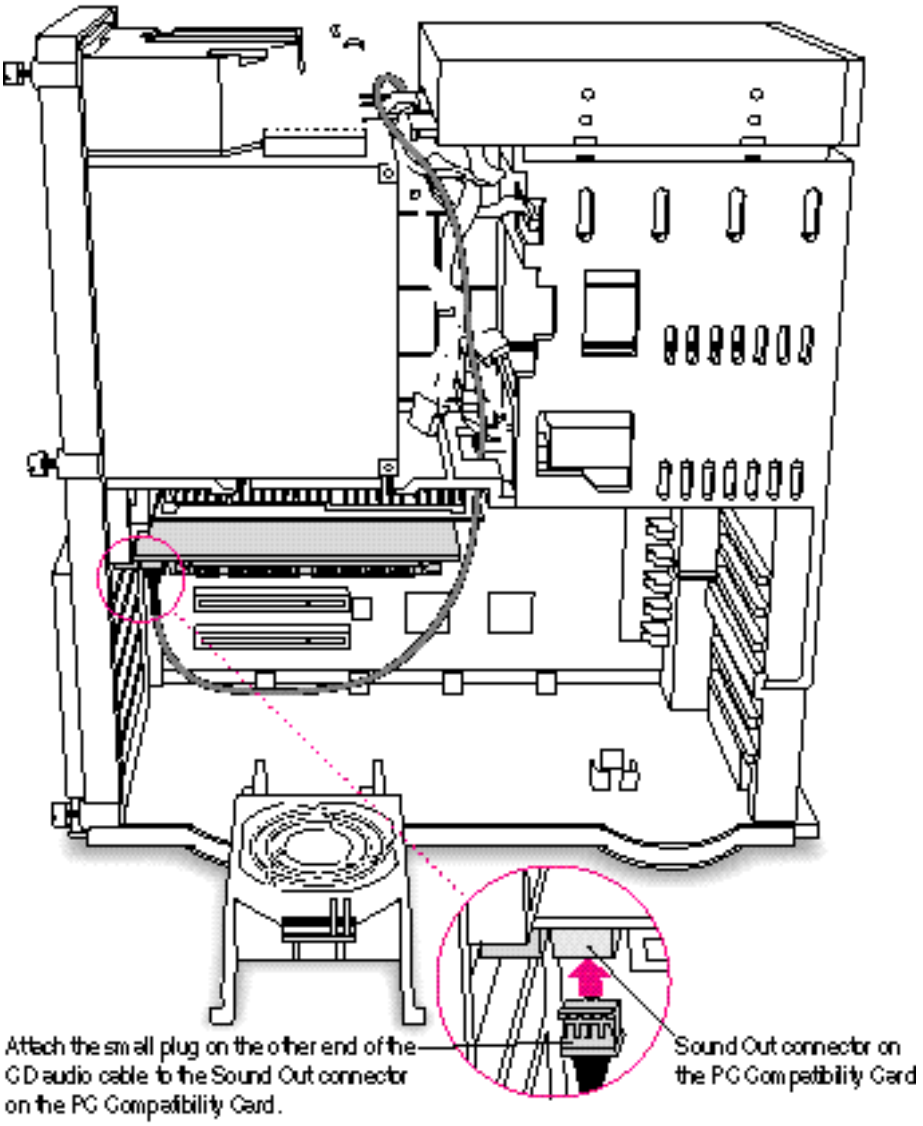


11 **Thread the cable through the interior of the computer.**

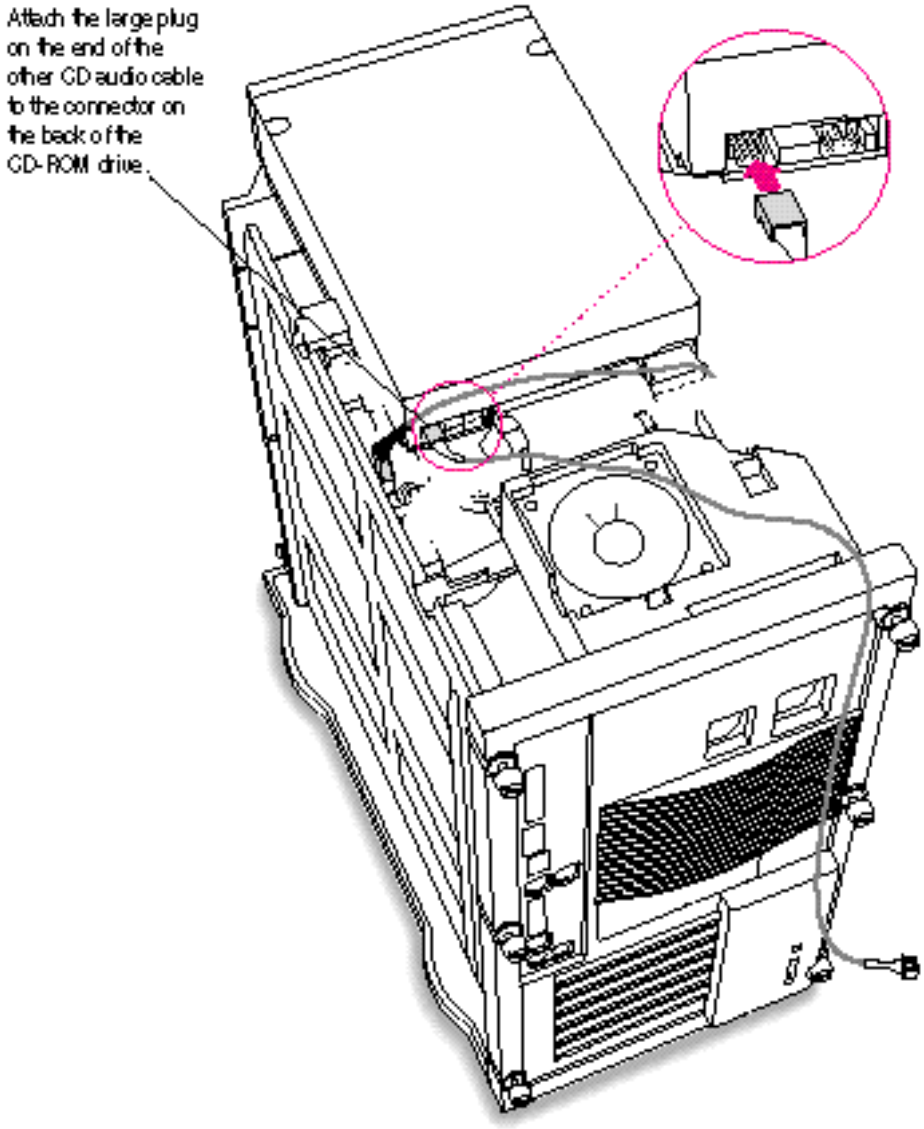


12 Plug the other end of the cable into the Sound Out connector on the PC Compatibility Card.

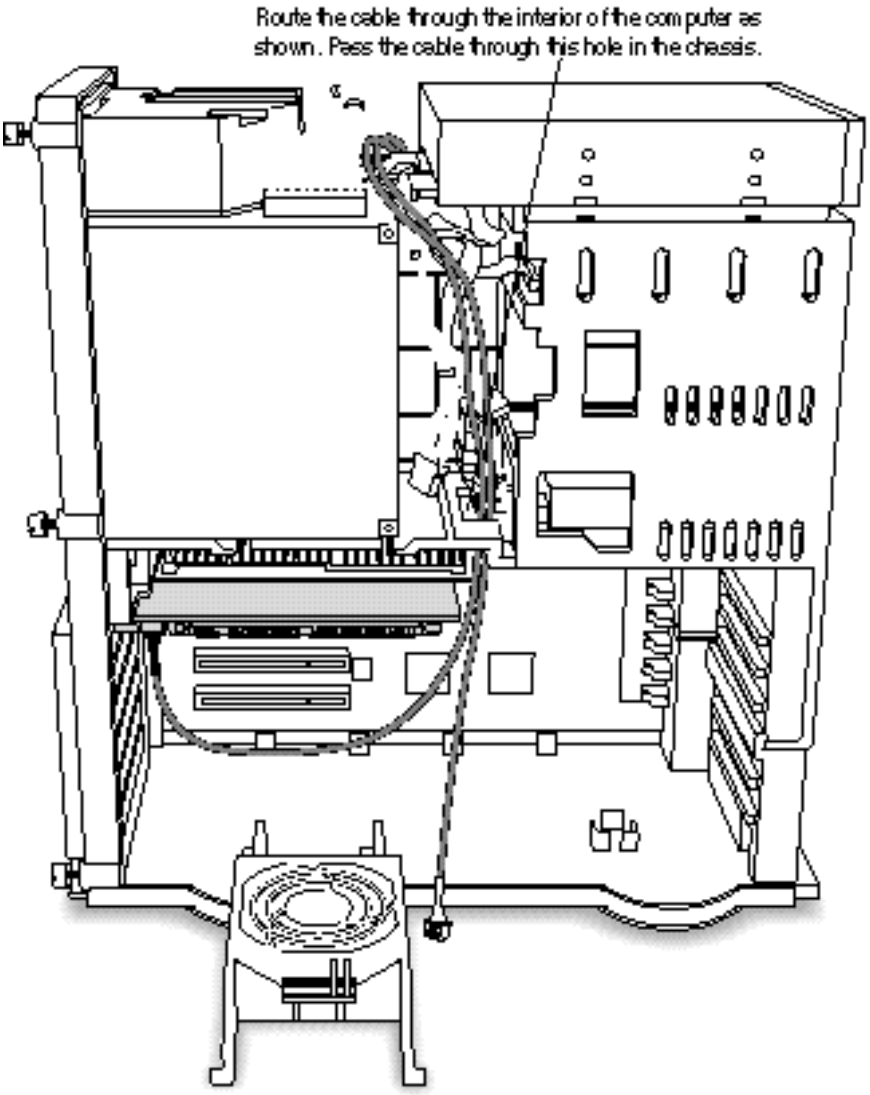
The Sound Out connector is next to the CD In connector, which is at the upper-left corner of the card.



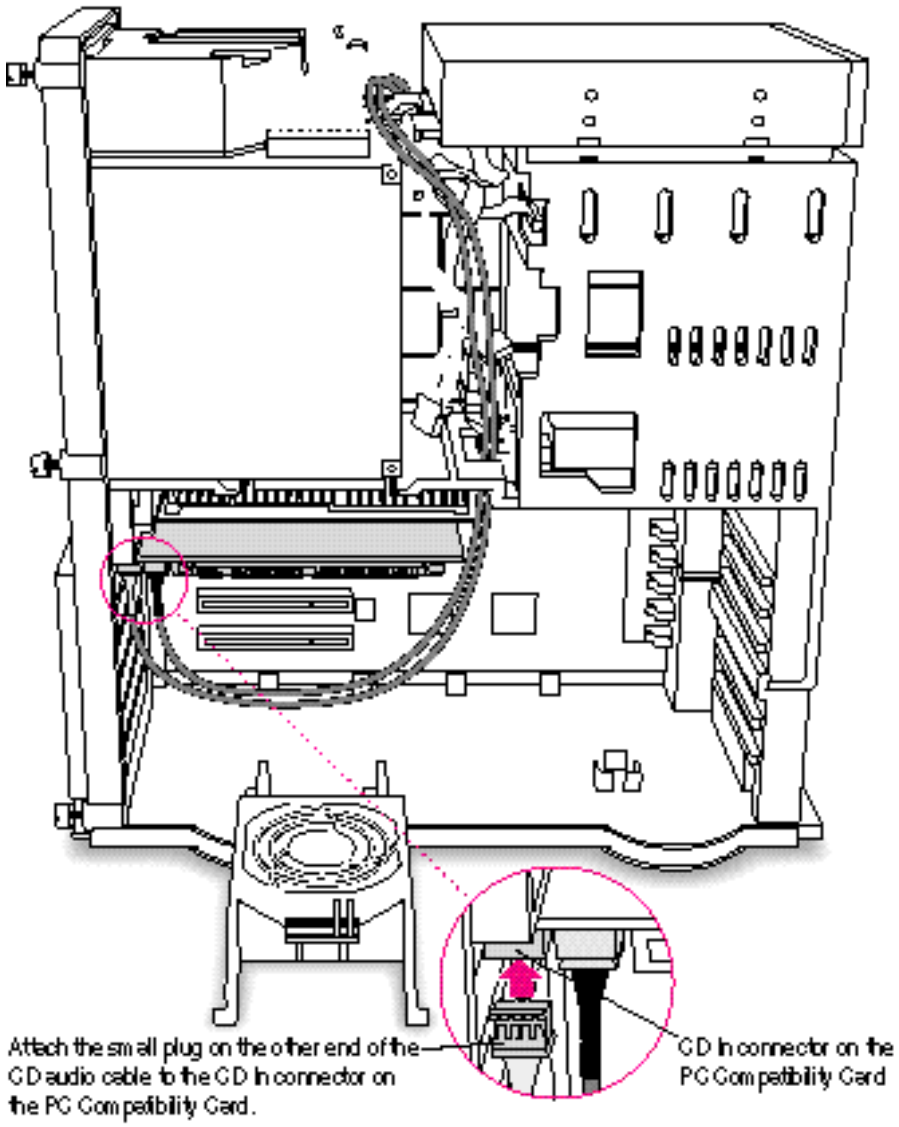
13 **Plug the second CD audio cable into the CD Out connector on the CD-ROM drive.**



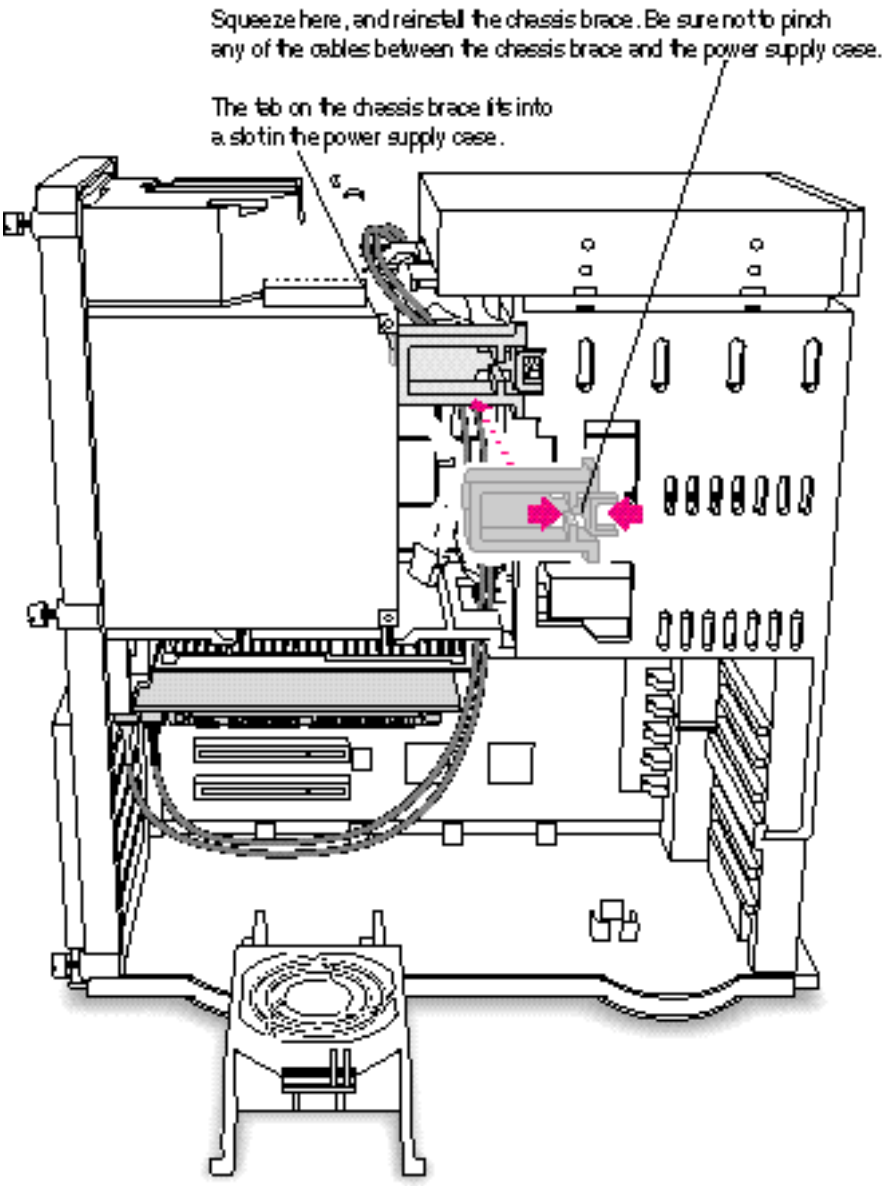
14 **Thread the second cable through the interior of the computer.**



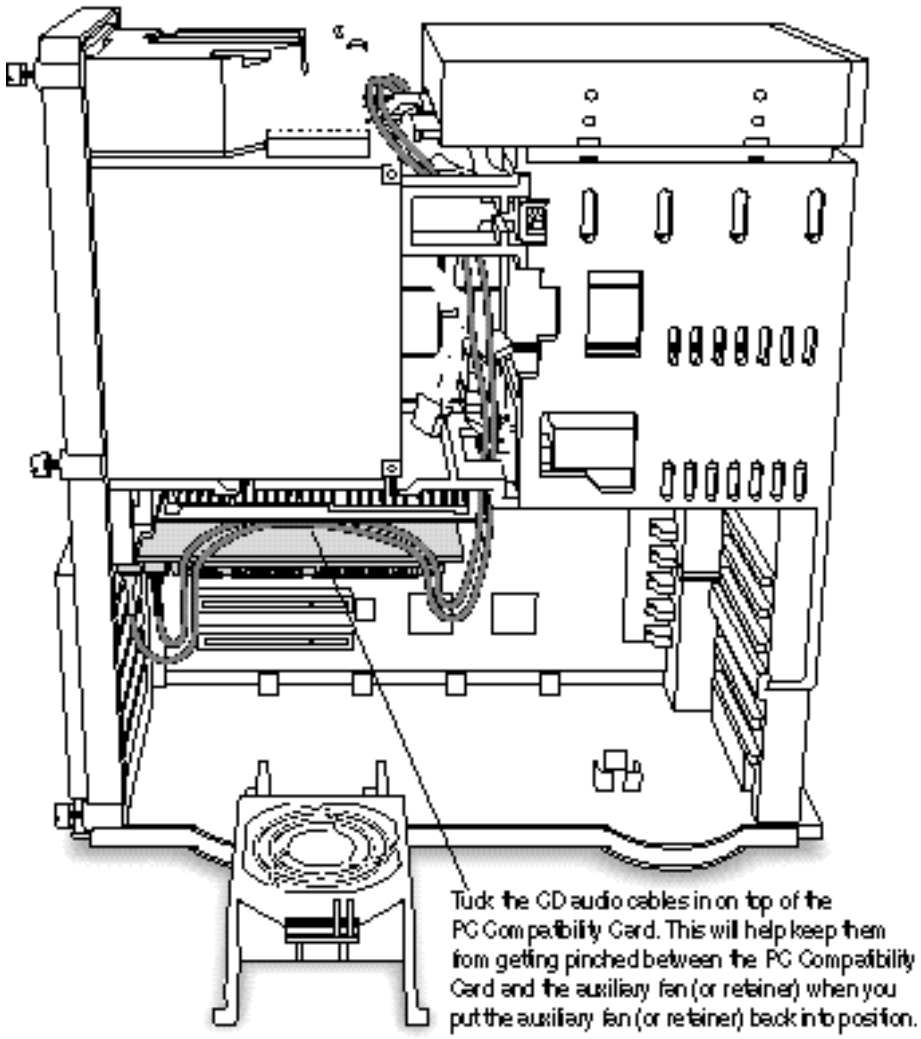
15 **Plug the other end of the second cable into the CD In connector on your PC Compatibility Card.**



16 **Replace the chassis brace.**

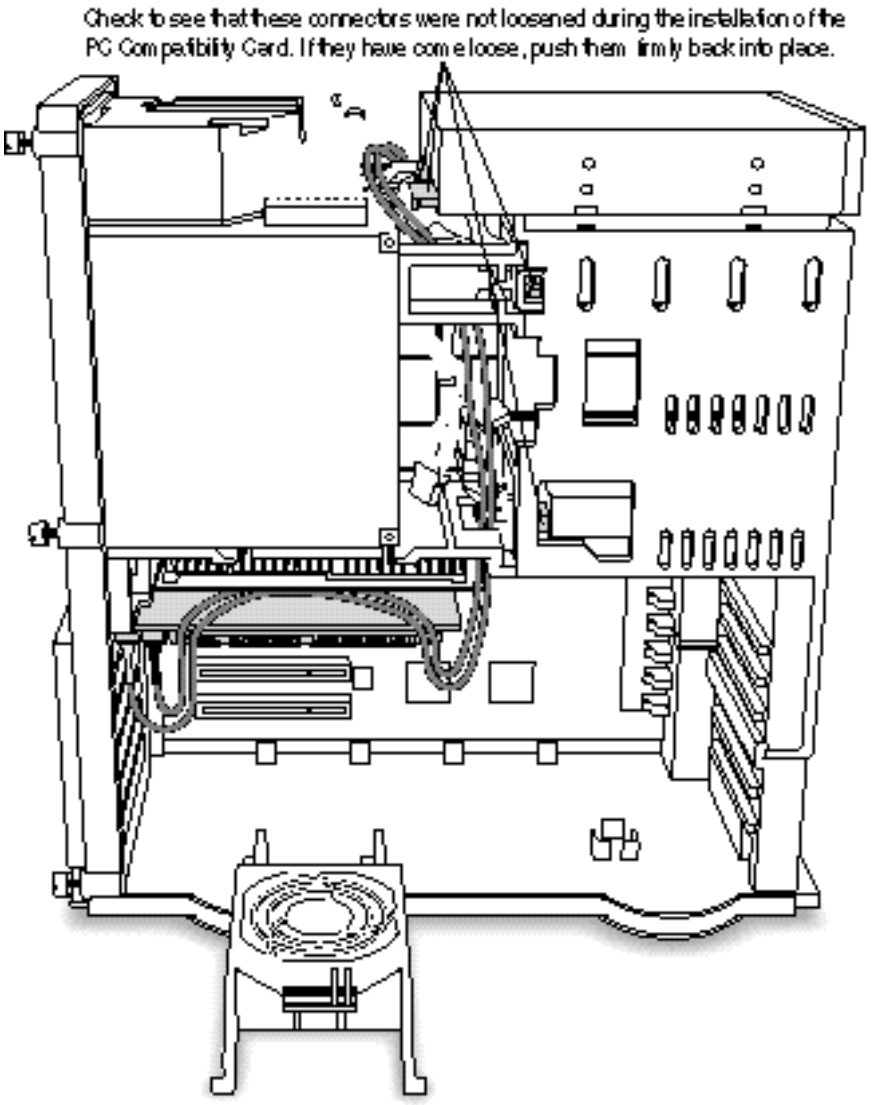


17 **Lay the CD audio cables on top of the PC Compatibility Card or another card, so that they're out of the way of the retainer or auxiliary fan.**



Closing the computer

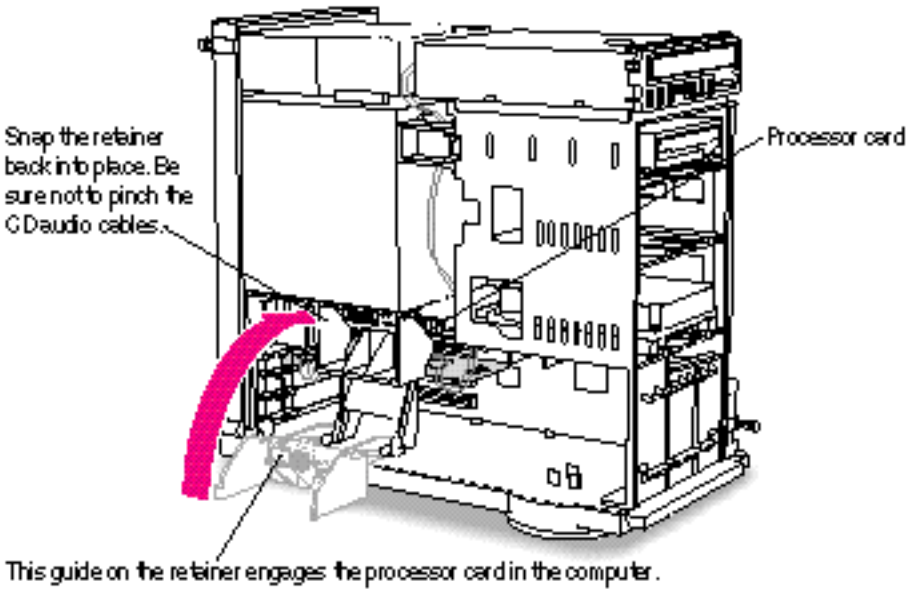
18 **Make sure all cables and cards are firmly connected.**



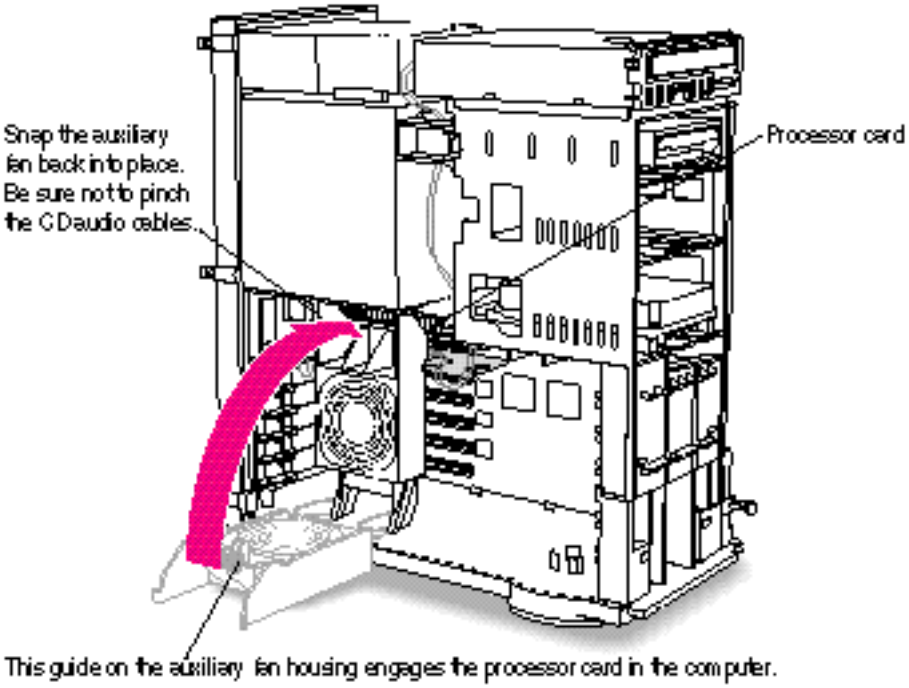
19 Replace the retainer or fan.

Make sure that the cables are not squeezed between the retainer or fan and the top of the card.

If you have a Power Macintosh 8500, use this illustration:

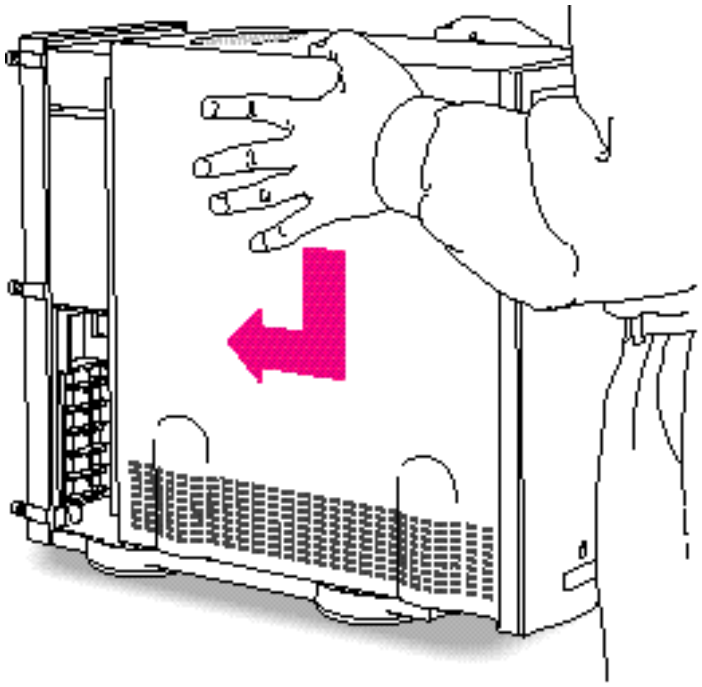


If you have a Power Macintosh 9500, use this illustration:



20 **Replace the cover on the computer.**

Lower the cover all the way down onto the case. Push the cover back until it touches the back panel.



21 **Tighten the screws on the back panel.**

You are now finished installing the card.

What's next?

Go next to Chapter 3, "Connecting Monitors and Other Equipment."

Then go to Chapters 4 through 7 for instructions on installing and using your software.

3 Connecting Monitors and Other Equipment

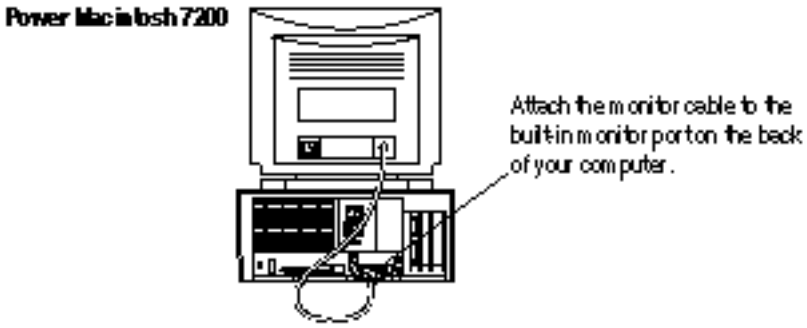
You can use a single monitor to display both the PC environment and the Mac OS environment, or you can simultaneously display both environments on two monitors.

Connecting a single monitor

How you connect a single monitor depends on the kind of computer you have and whether you installed the internal video connector assembly.

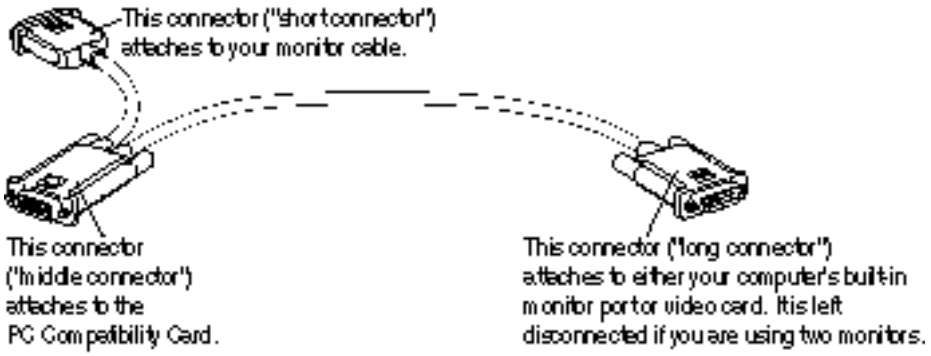
Connecting a single monitor to a Power Macintosh 7200 using the built-in monitor port

If you're using a single monitor with the Power Macintosh 7200, simply connect it to the computer's built-in monitor port. The internal video connector allows you to view the PC and Macintosh environments on your monitor without connecting an extra monitor cable.



Connecting a single monitor to a Power Macintosh 7200 using a video card or to a Power Macintosh 7500, 7600, 8500, or 9500

To connect a monitor, you use the loopback cable that came with your PC Compatibility Card.

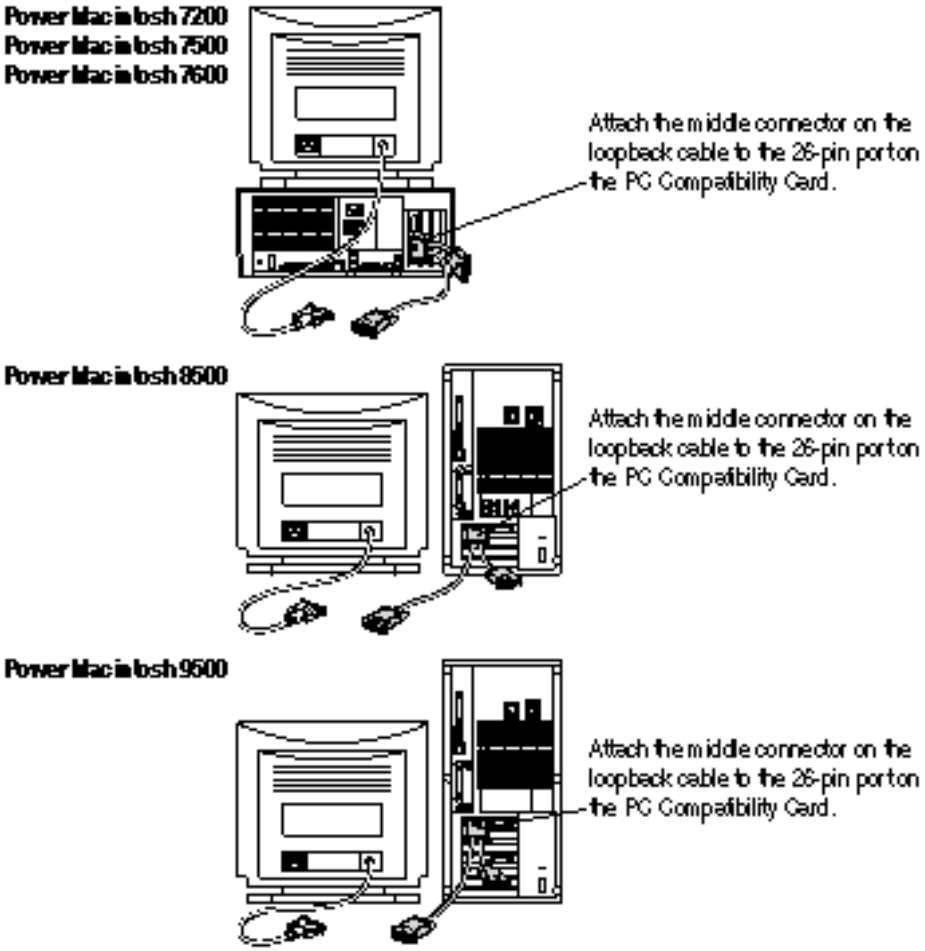


IMPORTANT A previous product, the DOS Compatibility Card, came with a different loopback cable that has four connectors on it instead of three. That cable does not work with your PC Compatibility Card.

To connect a monitor, you plug the loopback cable into your monitor, your computer's built-in monitor port (or video card port), and the port on the PC Compatibility Card.

1 **Plug the middle connector into the port on the PC Compatibility Card, and tighten the thumbscrews.**

This connector has a double row of pins and an Apple (🍎) icon on either side.

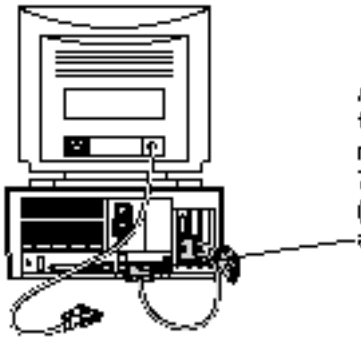


WARNING Do not plug a monitor into the joystick port that comes on some models of the PC Compatibility Card, and do not plug a joystick into a monitor port (marked with the icon |◯|). Serious damage can result to your equipment.

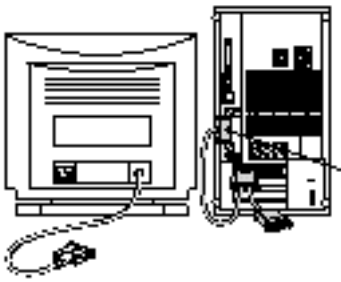
2 **Plug the connector on the long end of the loopback cable into your computer's built-in monitor port or video card.**

This connector has an Apple (apple) icon on one side and a monitor (monitor) icon on the other.

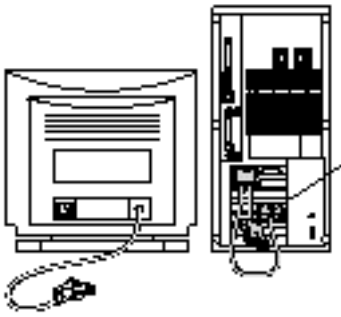
Power Macintosh 7200
Power Macintosh 7500
Power Macintosh 7600



Power Macintosh 8500

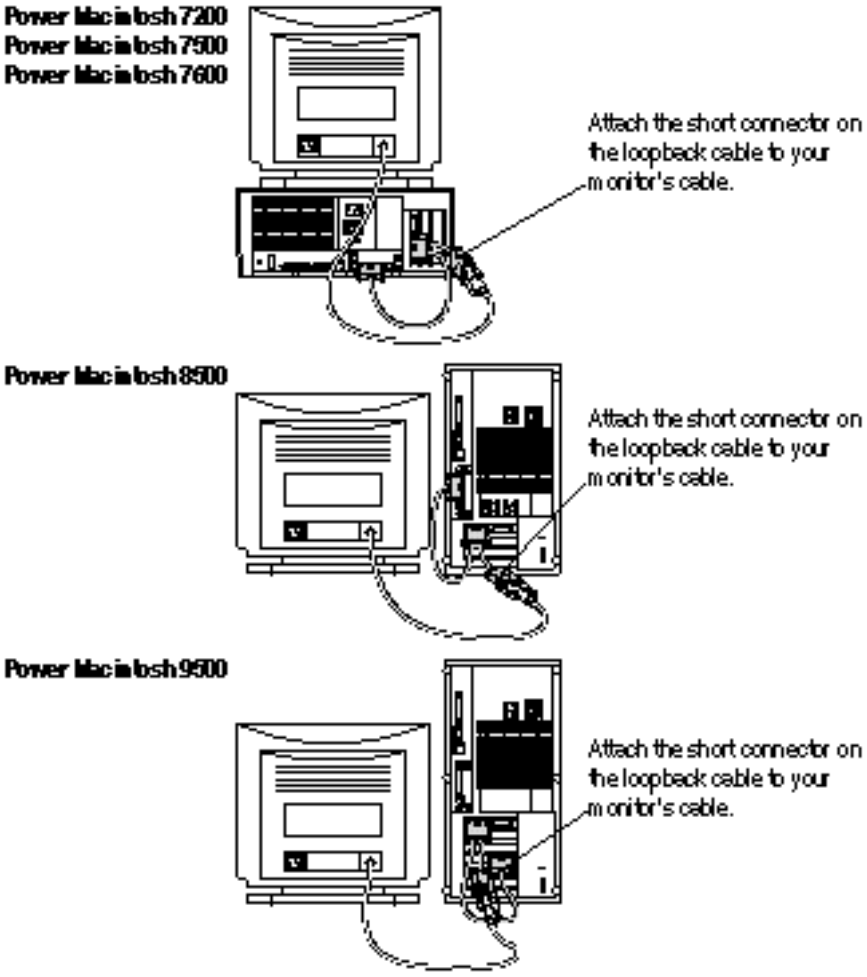


Power Macintosh 9500

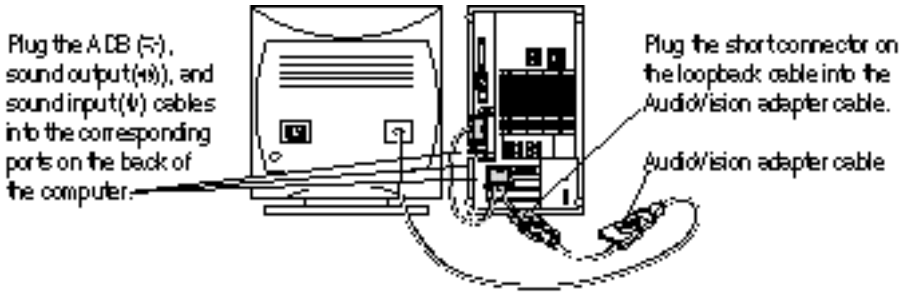


3 **Plug the connector on the short end of the loopback cable into your monitor's cable.**

This connector has an Apple (apple) icon on one side and a monitor (monitor) icon on the other.



Connecting an AudioVision 14 Display: Plug the short end of the loopback cable into your AudioVision adapter cable. Plug the AudioVision adapter cable into the AudioVision monitor cable. Then plug the ADB, sound output, and sound input cables from the adapter cable into the corresponding ports on the back of your computer. (For more information, see the documentation that came with your AudioVision monitor.)



Connecting two monitors

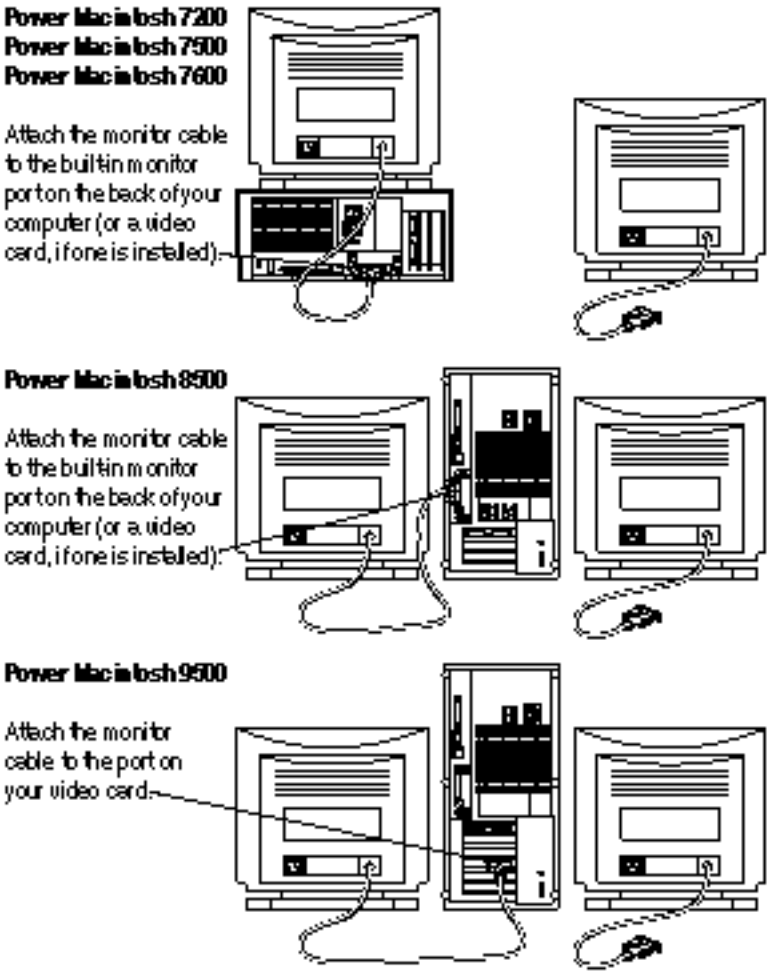
If you connect two monitors, you see the Mac OS environment on one and the PC environment on the other. You can use any combination of Macintosh and/or PC-compatible monitors (with the proper cable adapters, available from your monitor vendor or Apple-authorized dealer or service provider).

To connect two monitors, you connect one to your Macintosh built-in monitor port or video card, and the other to the short end of the loopback cable. Then you plug the middle connector on the loopback cable into the port on the PC Compatibility Card.

Multiple-scan monitor: If you want to use a multiple-scan monitor from a manufacturer other than Apple to display the PC environment, you also need to use a VGA-to-Macintosh adapter (available from your computer vendor). You connect this adapter between the monitor's cable and the loopback cable.

To connect two monitors, follow these steps:

1 **Connect the monitor you want to use for the Mac OS environment to the monitor port (|▭|) or video card port on the back panel of your computer.**

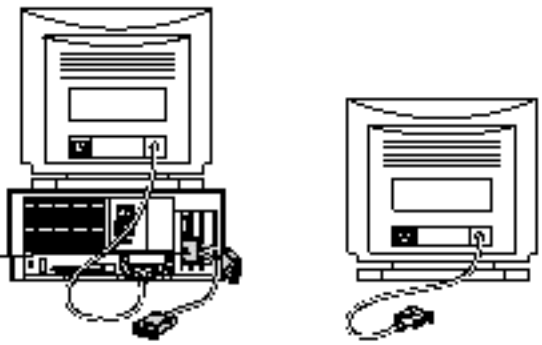


WARNING Do not plug a monitor into the joystick port that comes on some models of the PC Compatibility Card, and do not plug a joystick into a monitor port (marked with the icon |▭|). Serious damage can result to your equipment.

1 **Plug the middle connector on the loopback cable into the port on the PC Compatibility Card and tighten the thumbscrews.**

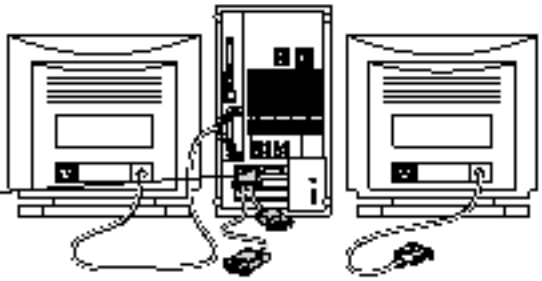
Power Macintosh 7200
Power Macintosh 7500
Power Macintosh 7600

Attach the middle connector on the loopback cable to the 26-pin port on the PC Compatibility Card.



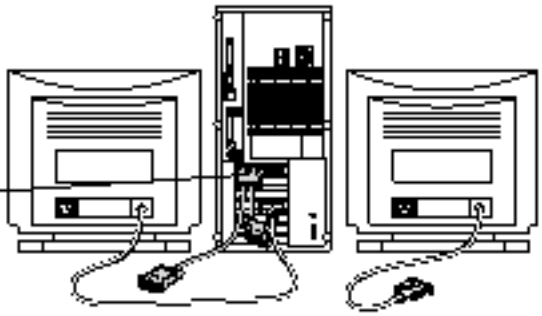
Power Macintosh 8500

Attach the middle connector on the loopback cable to the 26-pin port on the PC Compatibility Card.

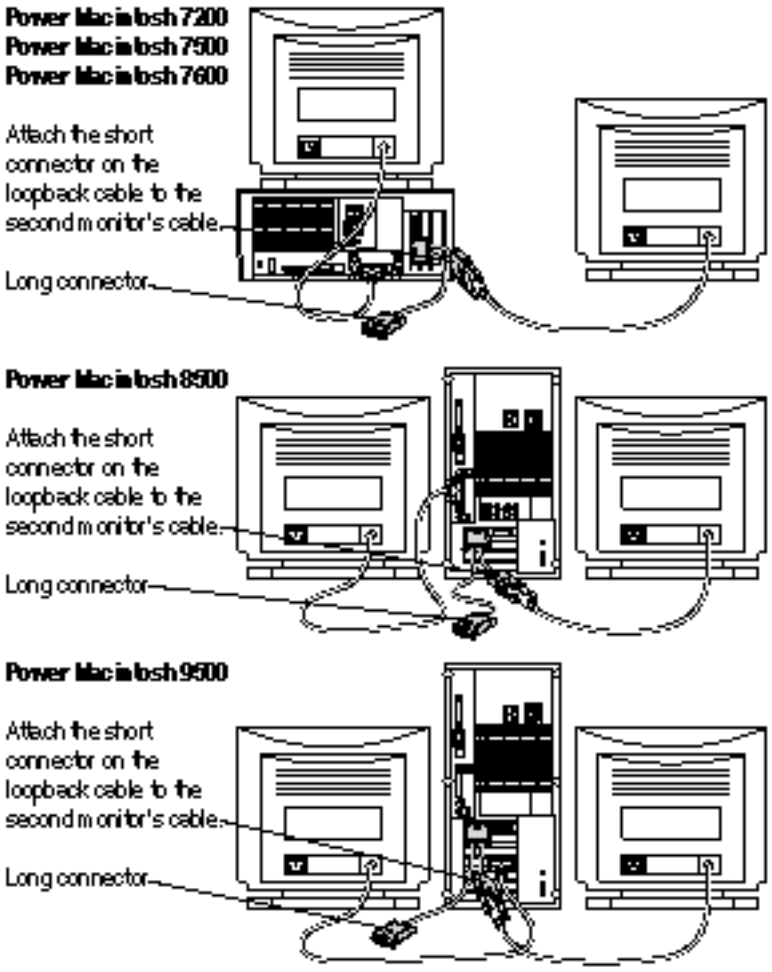


Power Macintosh 9500

Attach the middle connector on the loopback cable to the 26-pin port on the PC Compatibility Card.



3 **Plug the connector on the short end of the cable into the cable for the monitor that you want to use with the PC environment.**



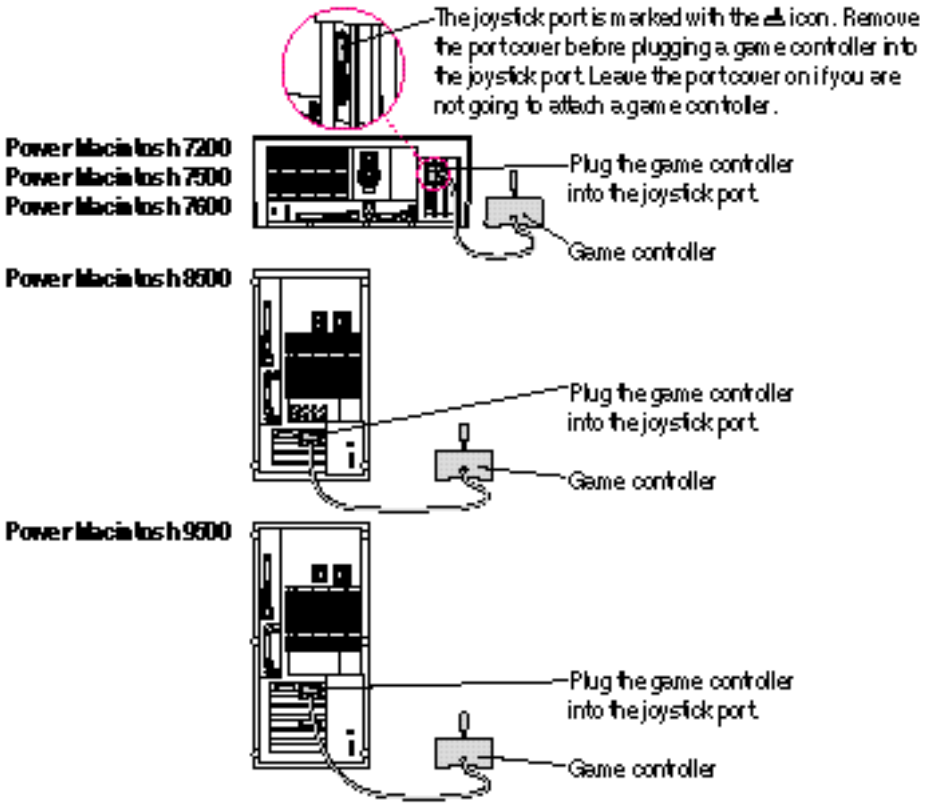
In most cases, you leave the long connector on the loopback cable unplugged. But if your computer has an additional video card or monitor port, you can plug the long connector into it. This will allow you to switch the monitor between the PC environment and the Mac OS environment.

Connecting a MIDI device

You can connect a MIDI (musical instrument digital interface) device to the game controller port that comes on some models of the PC Compatibility Card. To connect a MIDI device, you need a Sound Blaster–compatible MIDI-to-joystick adapter (available from your computer dealer.) For instructions on connecting devices to the joystick port, see the next section, "Connecting a PC Game Controller."

Connecting a PC game controller

Some models of the PC Compatibility Card come with a game controller port. To connect a PC game controller, such as a joystick, remove the plastic cover on the game controller port; then plug your game controller into the port.



WARNING Do not plug a monitor into the joystick port, and do not plug a joystick into a monitor port (marked with the icon). Serious damage can result to your equipment.

Connecting a mouse

You can use a standard Macintosh one-button mouse or other pointing device with the PC Compatibility Card. You can simulate the behavior of a PC mouse (which has two buttons) using keys on your keyboard. For more information, see the section "Using a Mouse" in Chapter 6.

You can also use a Macintosh-compatible ADB (Apple Desktop Bus) multi-button mouse and configure it to work as a PC-style mouse.

You connect this mouse to any available ADB port (marked with) on your Macintosh. You also need to install PC and Macintosh software to configure the mouse. See the documentation that came with your computer and mouse for more information.

Pointing devices specifically for a PC can't be used with the Macintosh because they do not use the ADB protocol.

ADB multibutton mouse devices are available from your Apple-authorized dealer.

Connecting a printer

You can print from the PC environment to any printer connected to the Macintosh.

You can also purchase a package such as GDT's PowerPrint that lets you attach your PC-compatible printer to a Macintosh port.

For more information, see the section "Setting Printer Options" in Chapter 5.

Connecting to a network

You can connect to shared disks on an AppleTalk or other Macintosh-compatible network by using the Mac OS file sharing feature and a sharing utility that comes with your PC Compatibility Card.

By installing the appropriate networking software, you can also connect your computer to a PC-compatible network, such as a Novell Netware network.

For more information, see the section “Setting Up Your PC on a Network” in Chapter 5, and also Appendix B, “Installing Network Client Software.”

Connecting a modem or other serial device

You can use a modem or other serial device connected to the Macintosh serial port in the PC environment. Macintosh computers do not use the same serial protocol that PCs use, so your modem or communications software may require adjustment. For more information, see Chapter 5, “Setting Up the PC Environment.”

4 Installing the PC Compatibility Card Software

This chapter covers how to install software for your PC Compatibility Card.

For information on setting up the software after you install it, including additional changes you may need to make to the DOS AUTOEXEC.BAT and CONFIG.SYS files, see Chapter 5, "Setting Up the PC Environment."

IMPORTANT If this guide came with your new computer, the PC Compatibility Card and its Mac OS software are already installed and a drive container has been created that contains MS-DOS. You may need to install the PC software on the *PC Utilities* CD.

There are several steps to installing your PC Compatibility Card software:

- installing the Mac OS software
- creating a storage area (called a *drive container*) for your PC software
- installing MS-DOS
- installing support software for DOS
- installing Microsoft Windows (optional)
- installing support software for Windows (necessary only if you install Windows)
- installing PC utilities (optional)
- installing your own PC software

To learn how to set up and use the software once you have installed it, refer to Chapter 5, "Setting Up the PC Environment" and Chapter 6, "Working in the PC Environment."

Installing Mac OS software

The Mac OS software for operating your PC Compatibility Card is on the CD-ROM disc labeled *PC Compatibility Card Mac OS Software* CD that came with your card.

Installing System 7.5 Update 2.0

If your computer is not running System 7.5.3, you should install the System 7.5 Update 2.0 from the *PC Compatibility Card Mac OS Software* CD. Installing this update will update previous versions of System 7.5 to System 7.5.3.

To install the System 7.5 Update 2.0, follow these steps:

1. **Insert the CD-ROM disc labeled *PC Compatibility Card Mac OS Software* CD into the disk drive.**

   If necessary, double-click the disc icon to open it.

2. **Double-click the System 7.5 Update 2.0 folder to open it.**

3. **Double-click the Installer icon to open it.**

   A message may appear describing the Installer software. Click OK. The Installer window appears.

4. **Make sure the disk named in the box is the one on which you want to install software.**

   If not, click Switch Disk until the correct disk name appears.

   Note: If you want to install only specific components, choose Custom Install from the Easy Install menu. In the Custom Install window, click to place an X in the boxes next to the components you want to install. Click the information symbol for more information about a component.

5 **Click Install.**

The software is automatically installed onto your hard disk.

6 **When the installation is complete, follow the instructions on the screen to quit the Installer and restart your Macintosh.**

Installing the PC Compatibility Card software

To install the Mac OS software for operating your PC Compatibility Card, follow these steps:

1 **Insert the CD-ROM disc labeled *PC Compatibility Card Mac OS Software* CD into the disk drive.**

If necessary, double-click the disc icon to open it.

2 **Double-click the PC Compatibility folder to open it.**

3 **Double-click the Installer icon in the PC Compatibility folder.**

A message may appear describing the Installer software. Click OK.

The Installer window appears.

4 **Make sure the disk named in the box is the one on which you want to install software.**

If not, click Switch Disk until the correct disk name appears.

Note: If you want to install only specific components, choose Custom Install from the Easy Install menu. In the Custom Install window, click to place an X in the boxes next to the components you want to install. Click the information symbol for more information about a component.

5 **Click Install.**

The software is automatically installed onto your hard disk.

6 **When the installation is complete, follow the instructions on the screen to quit the Installer and restart your Macintosh.**

The following Mac OS software is now installed:

Name	Location
Macintosh Easy Open	Control Panels folder
PC Exchange	Control Panels folder
PC Setup	Control Panels folder
Ethernet (built-in)	Extensions folder
PC Compatibility Guide	Extensions folder
PC Clipboard	Extensions folder
PC Clipboard Translators	Extensions folder
PC Net Exchange	Extensions folder
PC Network Extension	Extensions folder
PC Print Spooler	Extensions folder

Installing mouse software

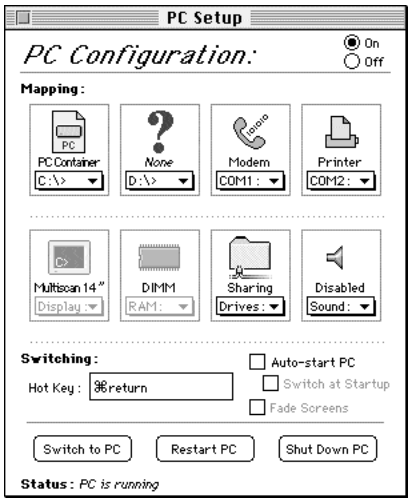
If you have a Macintosh-compatible multibutton mouse for use with your PC, it may come with software that needs to be installed on the Macintosh. Follow the instructions that came with your mouse.

Creating a drive container

A drive container is a file on your Macintosh hard disk that acts as a hard drive for the PC. You create a drive container using the PC Setup control panel.

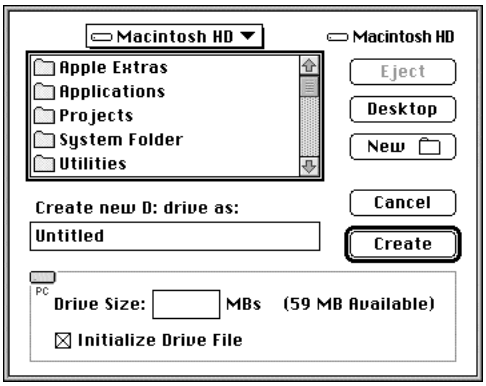
IMPORTANT If you received this manual with a computer, your hard disk already has a drive container that includes PC software. The container is called PC Container and is located on the desktop. You do not need to create another drive container unless you need more room to accommodate the software you want to install. You may want to install Microsoft Windows, the software on the *PC Utilities* CD, and your own PC software. For instructions, see "Installing Microsoft Windows" and "Installing PC Utilities," later in this chapter. Then turn to Chapter 5, "Setting Up the PC Environment," to learn more about your PC Compatibility Card.

1 Open the PC Setup control panel.



2 **Choose New Drive File from the C: or D: pop-up menu.**

A dialog box appears.



3 **Choose a location for the drive container.**

The drive container can be on any hard disk attached to the Macintosh that has sufficient free space.

4 **Type a name for the drive container; then press the Tab key.**

You can type up to 31 characters.

5 **Type a size (in MB) for the drive container.**

You can make the container as large as you want (limited by the space available on your hard disk).

The amount of space you need depends on the software you want to install. If you are installing DOS and a few small applications, you'll need about 20 MB. If you are installing Microsoft Windows 95, you'll need at least 100 MB. Check the documentation that came with your software to estimate how much space you'll need; then allow some extra room for growth.

6 **Click Create.**

Installing MS-DOS

To install MS-DOS software in a new drive container, you'll need the MS-DOS installation disks. Follow these steps:

IMPORTANT If you received this guide with a computer, MS-DOS is already installed. You do not need to reinstall the software unless you are having problems.

1 **Open the PC Setup control panel and click Switch to PC.**

The Macintosh desktop disappears. (If you're using two monitors, the image on the Macintosh monitor dims.) You see a message about a missing operating system or about a disk error.

2 **Insert the Microsoft MS-DOS Setup floppy disk and restart the PC by pressing the Control-Alt-⌦ (Del) keys.**

Make sure you press the ⌦ Del key (not the Delete key) when you press Control-Alt-⌦ to restart the PC.

3 **Follow the instructions that appear on the screen.**

Press ⌘-E to eject a disk when necessary.

4 **When installation is complete, restart the PC again.**

Press the Control-Alt-⌦ keys to restart the PC.

You should now see the DOS prompt.

Installing support software for DOS

The software on the *PC Compatibility Card PC Software* floppy disk that came with your PC Compatibility Card allows the card to work with the Macintosh computer, the Macintosh CD-ROM drive, networks, and other equipment.

IMPORTANT If you received this guide with a computer, the support software for DOS is already installed. You do not need to reinstall the software unless you are having problems.

To install the software, follow these steps:

1. **In the PC environment, insert the *PC Compatibility Card PC Software* floppy disk.**

   To switch to the PC environment from the Mac OS, press ⌘-Return, or open the PC Setup control panel and click Switch to PC.

2. **Type `A:\SETUP`; then press Return.**

3. **You may see a message asking if you want to install support for DOS or Windows. Press D for DOS.**

4. **You're asked to choose a drive for the files. Choose the C drive.**

5. **You're asked to choose a directory. It's best to accept the suggested directory, C:\APPLE.**

6. **Choose Yes to continue installation. If you're asked whether you want to overwrite files, choose Yes.**

7. **You're asked whether you want the program to modify your system files. Choose "Apply changes directly to system files."**

   If you choose to apply the changes to copies of the system files, the copies are called filename.number.

8. **When installation is complete, restart the PC by switching to the Mac OS (by pressing ⌘-Return), opening the PC Setup control panel, and clicking Restart PC.**

   You can also restart the PC by pressing the Control-Alt-⌦ keys. (For more information on restarting the PC, see "Switching Between the Mac OS and PC Environments" in Chapter 6.)

Installing mouse software

If you have a Macintosh-compatible mouse for use with the PC environment, you may need to install drivers for the mouse in the DOS environment. Follow the instructions that came with your mouse.

Installing Microsoft Windows

The PC Compatibility Card works with Microsoft Windows 3.1, Windows 3.11, Windows for Workgroups, and Windows 95.

You must install MS-DOS and the Windows support software on the *PC Compatibility Card PC Software* floppy disk before you can install any version of Windows.

IMPORTANT If you are installing a Windows 95 upgrade, you must have available a qualifying product from which you are upgrading (such as the Windows for Workgroups installation disks).

1. **In the PC environment, insert the first Windows installation floppy disk or CD-ROM disc.**

   To switch to the PC environment from the Mac OS, press ⌘-Return, or open the PC Setup control panel and click Switch to PC.

2. **Start the Windows setup program.**

   If you are installing from floppy disks, type `A:\SETUP`; then press Return.

   If you are installing from a CD-ROM disc, type `E:\SETUP`; then press Return.

3. **Follow the instructions that appear on the screen.**

   If you are installing from floppy disks, you can press ⌘-E to eject a disk when necessary.

4. **When installation is complete, restart the PC by switching to the Mac OS (by pressing ⌘-Return), opening the PC Setup control panel, and clicking Restart PC.**

   You can also restart the PC by pressing the Control-Alt-⌦ keys.

Installing support software for Windows

Next, you need to install the Windows support software. Follow these steps:

1. **If necessary, switch to the PC environment.**

   To switch to the PC environment from the Mac OS, press ⌘-Return, or open the PC Setup control panel and click Switch to PC.

2. **Insert the *PC Compatibility Card PC Software* floppy disk.**

3. **In Windows, choose Run from the File menu. In Windows 95, click Start; then choose Run from the menu that appears.**

4. **Type `A:\SETUP`; then press Return.**

5. **You're asked if you want to install support for DOS or Windows. Press W for Windows.**

6. **Follow the instructions that appear on the screen.**

   The recommended directory to install files is C:\APPLE. To change this location, click Set Location.

   By default, all options will be installed. You may choose not to install specific options. The installation options are:

   - Install Macintosh/Windows Copy and Paste: allows you to transfer Clipboard information between the Macintosh and PC environments.
   - Install Macintosh/PC Folder Sharing: allows you to share a Macintosh folder as a shared drive.
   - Install CD-ROM Support: allows you to use the CD-ROM discs in the PC environment.

7. **When installation is complete, restart the PC by switching to the Mac OS (by pressing ⌘-Return), opening the PC Setup control panel, and clicking Restart PC.**

   You can also restart the PC by pressing the Control-Alt-⌦ keys.

Configuring network support in Windows

To configure network support in Windows, see Appendix B, "Installing Network Client Software."

Installing PC utilities

Your PC Compatibility Card comes with the following programs and utilities on a CD-ROM disc labeled *PC Utilities* CD:

- QuickTime for Windows lets you view and manipulate video on the PC.
- Sound Blaster software lets you play music and manipulate sound files.
- Video drivers let you configure and use a variety of monitors.
- Keyboard files let you use keyboard layouts for a variety of languages.

It's best to install the video drivers. QuickTime, Sound Blaster, and the keyboard files are optional.

Installing QuickTime for Windows software

Follow these steps to install the QuickTime for Windows software:

1. **In the PC environment, insert the *PC Utilities* CD into the CD-ROM drive.**
2. **In Windows, choose Run from the File menu. In Windows 95, click Start; then choose Run from the menu that appears.**
3. **In the dialog box that appears, type `E:\QUICKTME\QTINSTAL` and then press Return.**
4. **Follow the instructions that appear on your screen to complete the installation.**

Installing Sound Blaster software in DOS or Windows

1. **In the DOS environment, insert the *PC Utilities* CD into the CD-ROM drive.**

   If you are in Windows, exit Windows to return to the DOS prompt. Do not attempt this installation from a DOS window in Windows.

2. **Type the following to start the install program:**

   ```
   CD E:\SOUND <return>
   W31SETUP.BAT <return>
   ```

3. **A message appears. Type <F2> to view the Read Me file. When you're finished viewing the file, type ESC to return to the main install screen.**
4. **Choose full installation by pressing Enter.**

5 **Choose the recommended paths by pressing Enter.**

6 **Choose the recommended settings by pressing Enter.**

7 **Allow the install program to modify your files by pressing Enter.**

8 **Choose to back up your existing file.**

9 **When the installer asks if you want to reboot the PC, choose No.**

Your sound software is now installed.

10 **Manually restart the PC by pressing Control-Alt-⌦.**

Installing Sound Blaster software in Windows 95

1 **In the PC environment, insert the *PC Utilities* CD into the CD-ROM drive.**

2 **In Windows 95, click Start; then choose Run from the menu that appears. In the dialog box that appears, type the following:**

```
E:\SOUND\W95SETUP.BAT
```

If a message asks you to insert a disk, click OK.

Let the setup program modify your .INI file.

3 **When the installer asks if you want to reboot the PC, choose No.**

4 **When the installation is complete, quit and restart Windows 95.**

To use the Sound Blaster programs in Windows 95, click Start, choose Programs, and select the Sound Blaster 16 directory.

IMPORTANT To use sound, Internal CD must be selected as the sound source in the Mac OS, and sound must be turned on. For more information, see "Configuring PC Sound" in Chapter 5.

Installing and configuring video software

This section describes basic installation and configuration. For more information about the video software, including installing and configuring video for DOS, see Appendix C, "Configuring Video Software."

Installing and configuring video software for Windows

1. **In the DOS environment, insert the *PC Utilities* CD into the CD-ROM drive.**

   If you are in Windows, exit Windows to return to the DOS prompt. Do not attempt this installation from a DOS window in Windows.

2. **Type the following:**

   ```
   CD E:\VIDEO\DRIVER\ <Enter>
   INSTALL <Return>
   ```

   The Install program's main menu appears.

3. **Select Drivers Installation from the menu.**

4. **Choose Microsoft Windows.**

5. **Choose Install Windows driver.**

6. **Choose to install display drivers only.**

7. **Verify the path for the drivers and press Return.**

8. **When installation is finished, press ESC until you get back to the main menu.**

9. **Select Utilities Installation from the menu.**

10. **Verify the path for the utilities and press Return.**

11. **You see a message asking whether the program can modify your AUTOEXEC.BAT file. Choose Yes.**

12. **Exit the INSTALL program and start Windows.**

13. **Open the ATI DeskTop program.**

    To learn more about the program, use the help feature or turn to Appendix C, "Configuring Video Software."

14 **Select a monitor type.**

15 **If you have a multiple-scan monitor, you can customize the display using the Screen Adjustment program.**

16 **Select a resolution and color depth using the FlexDesk+ program.**

Installing video software for Windows 95

The Windows 95 display driver that comes with the PC Compatibility Card offers better performance than the standard driver. To install the driver, follow these steps:

1 **In the PC environment, insert the *PC Utilities* CD into the CD-ROM drive.**

2 **Start the PC.**

Windows 95 appears.

3 **Click Start.**

4 **Select Run.**

5 **Type the following:**

```
E:\VIDEO\WIN95\SETUP
```

6 **Follow the on-screen help instructions to complete the installation.**

You may need to move windows to see the information presented. To move a window, drag the window's top bar.

Selecting and configuring monitors in Windows 95

Before performing this procedure, you need to install the video software as described in the previous section.

1 **Switch to the Mac OS, open the PC Setup control panel, and make a note of the monitor type that appears in the Monitors section of the control panel.**

You can switch to the Mac OS by typing ⌘-Return.

2 **Switch to the PC and make sure Windows 95 is running.**

You can switch to the PC by clicking Switch to PC in the PC Setup control panel, or by pressing ⌘-Return.

3 **Click Start, choose Settings, choose Control Panel, and double-click the Display icon to open the Display control panel.**

4 **Click the Settings tab in the Display control panel.**

Note: If you have a DDC compliant monitor (such as an AppleVision display) connected directly to the video port on the PC Compatibility Card, you do not need to select a monitor type. Windows 95 will make the appropriate settings for you. In addition, Windows 95 will configure the Display control panel so that only settings that work with your monitor appear.

5 **Click Change Display Type.**

6 **In the Monitor Type area, click Change.**

7 **If your monitor is listed in the dialog box that appears, click its name, click OK, and restart Windows. If not, click "Have Disk" and go on to the next steps.**

8 **Insert the *PC Software* floppy disk. Make sure the path in the text box is `A:\` and then click OK.**

9 **Click Show All Devices.**

10 **In the Models box, choose a model corresponding to the monitor type listed in the PC Setup control panel, then click OK.**

If this type is listed in PC Setup...	...choose this type in the Models box
Apple 14" (this type appears if you've connected a 12-, 13-, or 14-inch fixed-frequency monitor)	The "(all other Apple monitors)" type
Apple 16"	The "(all other Apple monitors)" type
Multiscan (this type appears if you've connected an AppleVision or other DDC compliant monitor)	Choose Plug and Play Monitor (VESA DDC) if this type is automatically selected in the list. Otherwise, choose AppleVision 1710AV, AppleVision 1710, or AppleVision 1705.
Multiscan 14"	Apple Multiple Scan 14" or Apple Multiple Scan 15"
Multiscan 17"	Apple Multiple Scan 17"
Multiscan 20"	Apple Multiple Scan 20"
19" Color	Your monitor model (if listed), or SuperVGA 1024 x 768

continued ▶

If this type is listed in PC Setup...	...choose this type in the Models box *(continued)*
Portrait	The “(all other Apple monitors)” type
21" Color	The “(all other Apple monitors)” type
21" Monochrome	The “(all other Apple monitors)” type
VGA	Standard VGA 640 x 480

To customize a multiple-scan monitor, click the Adjustments tab in the Display control panel.

11 **Restart Windows.**

A help window will appear with information on the video software. When you’re finished with the help window, uncheck the box at the bottom of the window to prevent its appearing each time you start up.

Installing keyboard files

Keyboard files allow you to use keyboard layouts for other languages and keyboards. For a list of languages supported, see the Read Me document that came with the PC Compatibility Card software.

Installing keyboard files in Windows

1 **Start Windows.**

2 **Insert the *PC Utilities* CD into the CD-ROM drive.**

3 **Open the International control panel.**

4 **Select the language you want in the Keyboard Layout area; then click OK.**

5 **In the Install Driver dialog box, click Browse.**

6 **Select the E drive, then locate the folder for the language you want.**

The path is `E:\KEYBOARD\WIN31\<language>\`

7 **Select the file you want; then close the control panel and restart Windows.**

Installing keyboard files in Windows 95

1. **Start Windows 95 and click the Start button.**
2. **Click Settings; then click Control Panel.**
3. **Double-click the Keyboard icon.**
4. **Select the Language tab.**
5. **Click Add.**
6. **In the list that appears, select the language you want; then click OK.**
7. **Click the name of the language whose keyboard layout you want to use; then click Set as Default, then click OK.**
8. **Insert the *PC Utilities* CD and click OK.**
9. **Click Browse; then select the E drive in the Drives window.**
10. **In the Folders window, locate the folder and file you want; then click OK.**

The path is `E:\KEYBOARD\WIN95\<language>`

Installing your own PC software

You can now install your own PC programs in the drive container you've created. Follow the instructions that came with the programs.

You may need to eject disks during installation. Press ⌘-E to eject a disk. Press ⌘-Y to eject a CD. For more information on working with disks, see "Using Floppy Disk Drives and Floppy Disks" and "Using CD-ROM Discs and Drives" in Chapter 6.

For further information on installing network client software, see Appendix B, "Installing Network Client Software."

What's next?

You've finished installing your PC software. Turn now to Chapter 5, "Setting Up the PC Environment," to learn how to configure your PC software.

5 Setting Up the PC Environment

This chapter contains information on the following aspects of your PC environment:

- DOS configuration files
- the PC Setup control panel
- monitors and video software
- RAM
- printer settings
- sound options
- PC drives
- shared volumes
- network settings
- serial port settings
- modem settings

Setting up your DOS configuration files

You may need to modify your DOS CONFIG.SYS file to work efficiently with your PC Compatibility Card. Follow these guidelines:

Editing the CONFIG.SYS file

Your CONFIG.SYS should include the following statements:

```
DOS=HIGH,UMB
DEVICE=C:\DOS\HIMEM.SYS /TESTMEM:OFF
DEVICE=C:\DOS\EMM386.EXE NOEMS
```

The first line loads DOS into high memory.

If you're using the DOS utility EMM386 and you don't require expanded memory, use the EMM386 line shown above. If you are using EMM386 and you do require expanded memory, include the following line instead:

```
DEVICE=C:\DOS\EMM386.EXE
```

For more information on making the best use of memory, see the information on memory management in the documentation for DOS or for your memory manager.

Setting the number of drive letters

You can share folders and volumes with the PC by assigning them to PC drive letters. When you install your PC software, the statement `LASTDRIVE=M` is included in the CONFIG.SYS file. This allows you to view up to nine folders or volumes at once.

To specify the number of drive letters, change your CONFIG.SYS file to include the following statement:

```
LASTDRIVE=x
```

where *x* is a letter between F and Z. (The PC reserves drive letters A through E.)

Each drive letter uses 100 bytes of PC memory.

Editing the AUTOEXEC.BAT file

Your AUTOEXEC.BAT file should include the following statements:

```
SET TEMP=C:\TMP
SET TMP=C:\TMP
PATH=C:\DOS
LOADHIGH C:\DOS\MSCDEX.EXE /S /D:CDDRVR /L:E
LOADHIGH C:\APPLE\APPLEPC
LOADHIGH C:\APPLE\MACSHARE
C:\DOS\SMARTDRV.EXE /X
```

The first two lines determine the location for temporary files used by DOS applications.

The LOADHIGH lines load support, file sharing and CD-ROM software into high memory. The letter “E” at the end of the MSCDEX.EXE line assigns the letter “E” to the CD-ROM drive. You can change it to any unused letter up to the limit specified in the LASTDRIVE line in your CONFIG.SYS file.

The SMARTDRV line creates a disk cache to speed up DOS disk operations. The /X option disables the write cache, which is the slower but safer option. For best CD-ROM performance, the line containing MSCDEX.EXE must come before the line containing SMARTDRV.EXE.

About the PC Setup control panel

You can control the following PC options in the PC Setup control panel:

- turning the PC Compatibility Card on and off
- mapping drives to drive containers or volumes
- mapping PC COM1 and COM2 ports
- setting up shared folders and volumes
- turning PC sound on and off
- changing the command (hot key) that switches between environments
- setting the PC to start automatically when you start your computer
- switching to the PC automatically when you start your computer

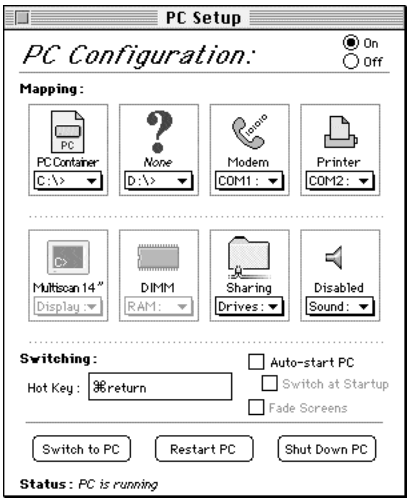
- setting the fade screen option when switching environments
- switching to, starting, and shutting down the PC

These options are described in this chapter and in Chapter 6, “Working in the PC Environment.”

To use the PC Setup control panel, follow these steps:

1 **Choose Control Panels from the Apple (🍎) menu.**

2 **Double-click the PC Setup control panel to open it.**



3 **When you have specified the settings you want, close the control panel.**

On-screen help: To see brief explanations of items in the control panel, choose Show Balloons from the Guide (?) menu. For detailed step-by-step help, see the PC Compatibility Guide, available in the Guide (?) menu.

Configuring monitors

To connect a monitor, see Chapter 3, “Connecting Monitors and Other Equipment.”

In most cases, the Mac OS recognizes the monitor you’re using to display the PC environment. The monitor type appears in the Display section of the PC Setup control panel. If you want special video features such as multiple colors and resolutions, you need to install and configure the video software that came with your card, as described in Chapter 4, “Installing the PC Compatibility Card Software.”

If the monitor you’re using to display the PC environment is not working correctly, make sure you have connected the monitor according to the instructions in Chapter 3, “Connecting Monitors and Other Equipment,” and make sure you have installed and configured the video software as described in Chapter 4, “Installing the PC Compatibility Card Software.” For further information on configuring video, see Appendix C, “Configuring Video Software.”

If a VGA monitor is not working correctly, also check whether your VGA-to-Macintosh adapter is configurable and try different settings.

Configuring monitors in the DOS environment

To configure monitors in the DOS environment, you use the ATI Install program. For more information, see Appendix C, “Configuring Video Software.”

Configuring monitors in the Windows environment

To configure monitors in the Windows environment, you use the ATI DeskTop program. For more information, see Appendix C, “Configuring Video Software,” and see ATI DeskTop’s on-screen help feature.

Configuring monitors in Windows 95

To configure monitors in Windows 95, you use the Display control panel. For more information, see Chapter 4, “Installing the PC Compatibility Card Software,” and Appendix C, “Configuring Video Software.”

RAM information

The RAM portion of the PC Setup control panel shows where RAM is installed on your PC Compatibility Card. If a DIMM (Dual Inline Memory Module) is installed, the word DIMM appears in the box. If no DIMM is installed, the words On Board appear in the box. If there is a problem with your DIMM or if you're missing a DIMM, the box says No RAM.

For more information on adding memory to your PC Compatibility Card, see Appendix A, "Adding Memory to a PC Compatibility Card."

Setting printer options

From the PC environment, you can print with most printers connected to the Macintosh, using the PC Print Spooler software.

The PowerPrint package by GDT Software lets you use a PC-compatible parallel-port printer with your Macintosh. For more information, contact GDT Software.

Setting up printing in the Mac OS

To print from the PC environment to a printer connected to the Macintosh, you need to select a printer in the Mac OS Chooser and set up the PC Print Spooler software. Follow these steps, then go to "Setting Up Printing in the PC Environment," later in this section.

1. **In the Mac OS environment, open the Chooser (in the Apple [] menu) and make sure a printer is selected.**

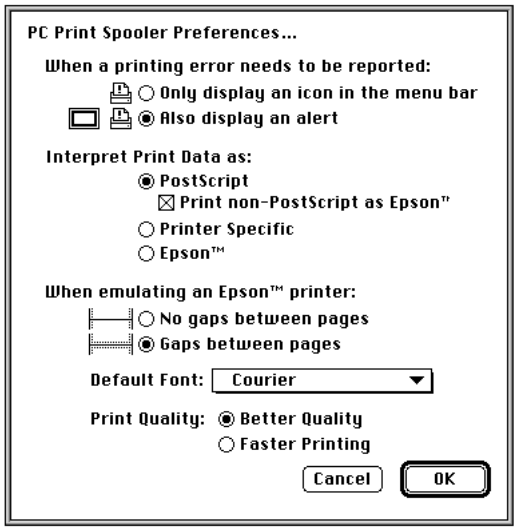
   If you are using a PostScript™ printer, be sure to select the LaserWriter 8 driver. For more information on selecting a printer, see the documentation or on-screen help that came with your computer.

2. **Open the Extensions folder inside the System Folder.**

3. **Open the PC Print Spooler icon.**

PC Print Spooler

4 **Choose Preferences from the File menu.**



5 **Choose your preference for printing error notification.**

6 **Choose an option under "Interpret Print Data as."**

- Choose PostScript if your printer supports PostScript. If you plan to print non-PostScript files on a PostScript printer (such as printing files from the DOS prompt), make sure the checkbox labeled "Print non-PostScript as Epson" has an X in it.
- Choose Printer Specific if you have selected in the Chooser a printer whose driver can read PC printer information directly from the PC environment. For a list of printer drivers that support this feature, see the Read Me file that came with your PC Compatibility Card.

  If the printer driver selected in the Chooser does not support this feature, you cannot choose this option.
- Choose Epson if you are using a QuickDraw printer (such as the StyleWriter or a LaserWriter that does not support PostScript).

  For more information about the Epson options, see the next section, "Epson Emulation Options."

7 **Click OK.**

Epson emulation options

If you chose Epson in the Print Spooler Preferences dialog box, you can make the following settings:

- Choose "Gaps between pages" if your applications are configured to print to a 60-line page. If your pages are clipped at the top or bottom when you print, select "No gaps between pages."
- The font in the Default Font box is used when you're printing ASCII text from DOS and when the Faster Printing option is selected. For best results, use a fixed-space font such as Courier or Monaco. Using a proportional font, such as Times®, may change your document's formatting.
- Choose Faster Printing when you want to quickly print text from a DOS application. When this option is selected, printers that use less than 300-dpi resolution (such as ImageWriter dot-matrix printers) will print in 72-dpi resolution.
- Choose Better Quality if you want Epson printer fonts in your document to be translated to corresponding Macintosh TrueType fonts. Because Epson printer fonts are fixed-space fonts, the TrueType font will be scaled to behave like a fixed-space font. Printers that use less than 300 dpi resolution will print in 144-dpi resolution.

For best results, use Epson printer fonts that map to a fixed-space TrueType font, or use graphical fonts supplied by your DOS application. The following table lists some Epson printer fonts and the TrueType fonts they are translated to if Better Quality is selected:

Epson font	TrueType font
Roman	Times (proportional)
SanSerif	Helvetica (proportional)
Prestige	Palatino (proportional)
Courier	Courier (fixed)
OCR-A, OCR-B	Monaco (fixed)
Script, Script C,	Monaco (fixed)
Orator, Orator S	Monaco (fixed)

Note: If you select Epson in the Preferences dialog box for PC Print Spooler, you can print only to the default paper size in the Mac OS Page Setup dialog box (US Letter in the U.S.). Make sure to configure your PC printing options appropriately.

Printing problems

If there is a printing problem, the file you're trying to print will be moved to the Spooler Rejected folder (in the Preferences Folder inside the System Folder). This might happen if, for example, you try to print a PostScript file with Epson selected in the PC Print Spooler Preferences.

After setting your preferences correctly, you can print the file automatically by moving the PC Spooler file from the Spooler Rejected folder to the Spooler folder. Or you can try switching to the PC environment and printing again.

Setting up printing in the PC environment

This section includes basic information you'll need to know to set up your printer drivers in the PC environment. For more detailed information, refer to the documentation that came with your software and printer.

IMPORTANT Some printer models support more than one printer language and may provide separate printer drivers for each language. If you are using the PostScript printing option, be sure to choose the printer driver that supports PostScript; otherwise, printing may not work properly.

Printing in the DOS environment

To print from the DOS environment, you need to select a printer driver for each application from which you want to print.

If you're using the PostScript printing option, choose the PostScript version of the printer driver for the printer connected to the Macintosh. If a driver is not available for that printer, you can use any PostScript Level 1 printer driver, such as Apple LaserWriter II NTX.

If you are using the Printer Specific feature, make sure to select a driver that works with the printer selected in the Chooser in each application from which you want to print.

If you are using the Epson emulation option, select the Epson LQ 2500 driver in each application from which you want to print. If that driver is not available, try one of the following:

- Epson LQ-2550/LQ-1050/LQ-1010
- Epson Action Printer 4500/ActionPrinter 4000

For best results, use a fixed-space font such as Courier or use your application's graphical fonts in your documents. See "Epson Emulation Options," earlier in this section.

Printing from Windows or Windows for Workgroups

If you're using the PostScript printing option, you should install and select the PostScript version of the Windows driver that came with your printer. If you don't have a Windows driver specifically for your printer, you can select another PostScript printer driver, such as one of the following:

- Apple LaserWriter II NTX if you have a PostScript Level 1 printer
- LaserWriter Pro 630 if you have a PostScript Level 2 printer

If you are not sure whether you have a PostScript Level 1 or Level 2 printer, choose a PostScript Level 1 printer driver. If you select a driver for a PostScript Level 1 printer, you can print to any PostScript printer. If you select a driver for a PostScript Level 2 printer, you can print only to printers that support PostScript Level 2.

If you are using the Printer Specific feature, make sure to select the driver for the printer selected in the Chooser.

If you are using the Epson emulation option, select the Epson LQ 2500 driver. If that driver is not available, try one of the following:

- Epson LQ-2550/LQ-1050/LQ-1010
- Epson Action Printer 4500/ActionPrinter 4000

Printing from Windows 95

Before you print from Windows 95 for the first time and any time you change printer drivers, you must follow these steps:

1. **In Windows 95, open the Printers folder.**

   If no printers are installed, see your Windows 95 documentation for instructions on how to add a printer.

2. **Select the printer that you are printing to.**

3. **Choose Properties from the File menu.**

   A window appears.

4. **Click Details.**

   The Details page appears.

5. **Click the Spool Settings button.**

   A dialog box appears.

6. **Click the button labeled "Disable bi-directional support for this printer." Then click OK.**

   If this button is not available, click OK; then go on to the next step.

7. **In the Properties window, click Port Settings.**

   The Configure LPT Port window appears.

8. **Make sure the checkbox labeled "Check port state before printing" is unchecked. Then click OK.**

   After selecting or changing to a PostScript printer driver, you must also follow these steps:

9. **In the Properties window, click PostScript.**

10. **Click Advanced.**

    A dialog box appears.

11 **Make sure the checkboxes labeled “Send CTRL+D before Job” and “Send CTRL+D after Job” are unchecked. Then click OK.**

12 **Close the Properties window.**

Other than these settings, setting up printing from Windows 95 is the same as printing from Windows. See the previous section, “Printing From Windows or Windows for Workgroups.”

Configuring PC sound

You can use three kinds of sound in the PC environment:

- **PC beep sounds**
- **CD sound:** You can play and control audio CDs in the PC environment.
- **Sound Blaster sound:** You can hear Sound Blaster sound in games and other programs, and you can use Sound Blaster–compatible utilities to manipulate sound files. With some computer models, you can also record sound from audio CDs in the PC environment. For more information about Sound Blaster capabilities, see the Sound Blaster manual that came with your card. (Some models of the PC Compatibility Card do not include Sound Blaster capability.)

You can hear sound from the PC environment through the Macintosh speaker or through headphones.

The Mac OS treats all PC sound as if it were coming from the internal CD-ROM drive. You can still use the internal CD-ROM drive to play CDs and CD-ROM discs in the Mac OS.

Turning PC sound on and off

To hear PC sound, you need to turn on sound for the PC and set the sound input device in the Mac OS. Follow these steps:

Note: Before you begin, make sure that sound is turned on (not muted) in the Mac OS.

1. **Open the PC Setup control panel.**
2. **Choose an option from the Sound pop-up menu.**

   You can choose the following options:

   - To hear PC sounds in both environments, choose Enabled.
   - To hear PC sounds only in the PC environment, choose Auto Enable.
   - To shut off PC sounds, choose Disabled.

3. **Close the PC Setup control panel.**

To configure the Mac OS to play PC sounds, follow these steps:

1. **Open the Monitors and Sound control panel.**
2. **Click the Sound button to display the sound options.**
3. **Choose the option you want from the Sound Input pop-up menu.**

   - To hear PC sounds, choose Internal CD from the Sound Input pop-up menu.
   - If you don't want to hear PC sounds, choose a different option from the Sound Input pop-up menu.

4. **Close the control panel.**

Configuring PC drives

To work in the PC environment, you need to tell the PC where PC software and files are stored. You do this by mapping PC drive letters to storage areas using the PC Setup control panel. You can map drive C or D to a PC-formatted SCSI hard drive attached to your Macintosh, or to a drive container—a file you create on a Macintosh hard drive that acts as a virtual PC drive. You can also use a drive container created by SoftPC or SoftWindows.

Note: A hard drive or drive container only boots when assigned to drive C.

Creating a drive container

To create a drive container for drive C or D, follow these steps:

1. **Open the PC Setup control panel.**
2. **Choose New Drive File from the C: or D: pop-up menu.**
3. **In the dialog box that appears, choose a location for the drive container.**
4. **Type a name and a size for the container.**

   The size you choose depends on the amount of space available on your hard disk and on the size of the files you want to store in the drive container.

5. **If you want to format the drive container with multiple partitions, click Initialize Drive File to remove the X from the box.**

   If you want the container to have a single partition, leave this box checked and PC Setup will initialize the container for you.

6. **Click Create.**
7. **To format the container with multiple partitions, switch to DOS and prepare the drive using the FDISK and FORMAT commands.**

   To make the container bootable, use the /S parameter of the FORMAT command. See the DOS HELP command for more information.

Mapping a drive to a PC-formatted hard disk

To map a drive to a PC-formatted hard disk connected to your Macintosh SCSI port or SCSI chain, you first assign the drive letter to the hard disk; then you make sure the hard disk driver is not being loaded by PC Exchange. Follow these steps:

1. **Open the PC Setup control panel.**
2. **Choose Drive Partition from the C: or D: pop-up menu.**
3. **In the dialog box that appears, locate the hard disk drive you want to assign.**
4. **Open the PC Exchange control panel.**
5. **Click the Options button.**
6. **Make sure the SCSI driver for the PC drive is not checked. Then click OK.**

To make the drive bootable, switch to DOS and use the FORMAT command with the /S parameter. See the DOS HELP command for more information.

Changing a drive assignment

To change the container or partition assigned to the C or D drive, follow these steps:

1. **Open the PC Setup control panel.**
2. **To assign a new drive container, choose Other Drive File from the C: or D: pop-up menu. To assign a PC-formatted hard disk (or partition), choose Drive Partition.**
3. **In the dialog box that appears, locate the container or partition you want to assign.**
4. **Make sure the item is not being used as a disk drive in the Mac OS environment.**

If you have a Mac OS utility that mounts PC drives or containers (makes them available to the Mac OS as disks), the item may appear as an icon on the Mac OS desktop. If so, drag the icon to the Trash to unmount it.

WARNING If you don't unmount the item, you will lose information if both the Macintosh and the PC write to the device at the same time.

5 **Click Restart PC.**

IMPORTANT If you intend to make your PC drive available to the Mac OS, do not use a PC compression program. The Mac OS cannot mount compressed drives.

Changing the size of a drive container

To change the size of a drive container, you create a new one, move files to it, and delete the original container. If you need more space, you can also create an additional drive container to supplement an existing one.

IMPORTANT Some programs do not work properly if they are run from a drive letter other than the one on which they were originally installed.

The following procedure assumes that drive C is assigned to the drive container you want to replace, and drive D is available to be assigned to the new drive container. If drive D is already assigned, you need to unassign it temporarily (choose None from the D: pop-up menu in the PC Setup control panel). This will not affect the files within the container.

To create a new, different size drive container, follow these steps:

1 **Create a new container for drive D.**

Follow the instructions in "Creating a Drive Container," earlier in this section.

Configure the new container with the new size that you want.

2 **Click Restart PC at the bottom of the PC Setup control panel.**

3 **If you wish to make the new drive container bootable, switch to the PC environment and type the following at the DOS prompt:** `FORMAT D: /S`

Answer Yes when DOS asks if you're sure.

4 **Move all the files from the old drive container to the new one.**

You can move the files in either the Mac OS or the PC environment.

5 **In the PC Setup control panel, choose None from the D: pop-up menu to unassign the drive container.**

6 **Choose Other Drive File from the C: pop-up menu. Locate and select the container you just created.**

Your new container is now assigned to drive C.

7 **Click Restart PC at the bottom of the PC Setup control panel.**

8 **Click Switch to PC.**

9 **At the DOS prompt, type `DIR`.**

You should see a directory of all the files you copied.

10 **Verify that your files have been copied correctly.**

11 **In the Mac OS, drag the original container to the Trash and choose Empty Trash from the Special menu.**

Using shared volumes

You can set up a Mac OS folder, hard disk, shared disk, or CD-ROM disc on a network to act as a PC drive.

Sharing a folder is a convenient way to transfer files between the Mac OS and the PC environment. Sharing is also useful for network volumes, CD-ROM drives, or other volumes that otherwise would not be readily available to the PC environment.

Note: DOS treats all shared volumes as if they were on a network. Some DOS commands, such as FORMAT, CHKDSK, UNDELETE, and SUBST, will not work on these shared volumes.

Sharing a volume

To set up a shared volume, follow these steps:

1. **If the PC is not already running, open the PC Setup control panel and click Start PC.**
2. **In the PC Setup control panel, open the Sharing pop-up menu and choose an available drive letter.**

   If no drive letters appear, switch to the PC, open the CONFIG.SYS file, and make sure that both a LASTDRIVE statement appears and sufficient available drive letters are assigned. See “Setting Up Your DOS Configuration Files,” earlier in this chapter.

3. **In the dialog box that appears, select a folder or disk you want to share.**

   You can share a Mac OS folder, hard disk, shared disk, or CD-ROM disc. Do not attempt to share floppy disks.

4. **To automatically share this item whenever you start up the PC, click Attach at Startup.**

   Automatically shared items are underlined in the Sharing pop-up menu.

   For more information on transferring files between the PC environment and the Mac OS, see “Using Floppy Disk Drives and Floppy Disks,” “Copying and Pasting Information Between Environments,” and “Using Shared Folders and Volumes” in Chapter 6. Also see the PC Compatibility Guide, available in the Guide (?) menu.

Unsharing a volume

If you no longer want to share a volume, follow these steps:

1. **In the Mac OS environment, open the PC Setup control panel.**
2. **Open the Sharing pop-up menu and choose the name of the volume you want to unshare.**

   A warning message appears telling you that the item will no longer be available. Click OK.

Turning off automatic sharing

1. **In the Mac OS environment, open the PC Setup control panel.**
2. **Open the Sharing pop-up menu and choose the name of the volume you no longer want to share automatically.**

   Automatically shared items are underlined in the Sharing pop-up menu.

Setting up your PC on a network

Your PC Compatibility Card supports most networking protocols, operating systems, and application programs that are compatible with the following network drivers: Novell's Open Data-Link Interface specification (ODI) or Microsoft's Network Driver Interface Specification (NDIS) version 2.0.

IMPORTANT Versions of the PC Compatibility Card with less than 8 MB of RAM do not have sufficient memory to support all kinds of networking.

With some computer models, you can run TCP/IP in both environments simultaneously. With other models, you can use networking in both environments simultaneously as long as you use different protocols (for example, NetWare in the PC environment and AppleTalk in the Mac OS, or IPX in one environment and TCP/IP in the other).

To set up networking, you need to acquire and install networking client software in the PC environment. For more information, see Appendix B, "Installing Network Client Software."

Configuring the PC serial ports

Your PC Compatibility Card supports two serial ports, COM1 and COM2. You can map these ports to Macintosh serial ports (such as the printer or modem port) or to a text file for later processing. Or you can leave the ports unmapped.

- **To map a PC COM port, open the PC Setup control panel and choose a setting in the COM1 or COM2 pop-up menu.**

  Macintosh serial ports already in use appear dimmed in the menu.

IMPORTANT Mac OS programs cannot access a port that you've assigned to the PC environment. To use the port in the Mac OS, you must unmap the PC COM port and restart the PC.

Setting up a modem or other serial device

From the PC environment, you can use a modem or other serial device connected to the Macintosh serial port.

Because the Macintosh uses the RS-422 protocol, several RS-232 signals are not available through a Macintosh serial port:

- Carrier Detect (CD)
- Data Set Ready (DSR)
- Request to Send (RTS)
- Ring Indicator (RI)

You can set most communications applications to respond to the CARRIER string sent back by most modems rather than requiring Carrier Detect. For more information about using serial ports, see your DOS and Windows documentation.

Building a custom cable

The following chart lists the signals present on the Macintosh Mini DIN-8 connector, and the pins that carry these signals on PC-style DB-9 and DB-25 connectors. You may be able to use this information to build a custom cable to connect your PC-compatible serial device to a Macintosh serial port. Refer to the manual for the serial device you want to connect for the recommended serial connection.

Macintosh signal	Macintosh Mini DIN-8	DB-9	DB-25	RS-232 name
HSK0	1	4	20	DTR
HSK1	2	8	5, 8	CTS, DCD
TXD-	3	3	2	TXD
GND	4	5	7	GND
RXDA-	5	2	3	RXD
TXDA+	6	N/C	N/C	
GP1	7	N/C	N/C	
RXD+	8	5	7	GND

Connecting a joystick

You can connect a game controller to the PC Compatibility Card joystick port (not available on some models of the PC Compatibility Card). For more information, see Chapter 3, “Connecting Monitors and Other Equipment,” and see the documentation that came with your joystick.

Connecting a MIDI device

With a special adapter, you can connect a MIDI device to the joystick port on your PC Compatibility Card. (Not all versions of the card come with a joystick port.) For more information, see Chapter 3, “Connecting Monitors and Other Equipment,” and see the documentation that came with your MIDI device and MIDI adapter.

6 Working in the PC Environment

This chapter describes the software that you use to work in the PC environment, to switch between the Mac OS and PC environments, and to share data between the environments.

This chapter describes:

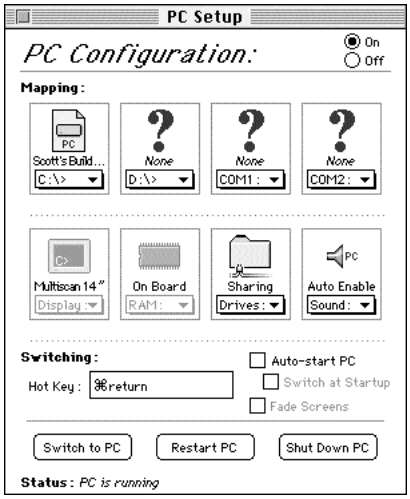
- switching between the Mac OS and PC environments
- turning the PC on and off
- using floppy disk drives and floppy disks
- using CD-ROM discs and drives
- using a mouse
- using keyboards
- copying and pasting information between Mac OS and Windows documents
- using shared folders and volumes
- using PC files in the Mac OS

Switching between the Mac OS and PC environments

You can use one environment—Mac OS or PC—at a time. You switch between the Mac OS and the PC environments using the PC Setup control panel. Follow these steps:

1. **Choose Control Panels from the Apple (🍎) menu.**

2. **Double-click the PC Setup icon to open the control panel.**



3. **Click Switch to PC to switch to the PC environment.**

   If you are using a single monitor to display both environments, you can set the screen to fade briefly before switching environments by clicking the checkbox next to Fade Screens.

4. **To switch back to the Mac OS, press ⌘-Return.**

Switching environments with a keyboard command

You can set a keyboard command, or hot key, to switch between the Mac OS and the PC environments. The default hot key is ⌘-Return.

Note: If you set a new hot key, it will work in both environments, and you can still use ⌘-Return to switch from the PC to the Mac OS. But ⌘-Return will not work to switch from the Mac OS to the PC.

To set a new hot key, follow these steps:

1. **In the Mac OS environment, open the PC Setup control panel.**
2. **Click the Hot Key text field.**
3. **Type the command you want to use to switch environments.**

The ⌘ key is automatically included; you type the additional characters you want. For example, you might type Option-P, setting the switch command to ⌘-Option-P.

Some character combinations cannot be used and will be ignored if you type them.

Turning the PC on and off

You can use the PC Setup control panel (in the Mac OS) to start, restart, shut down, or turn off the PC.

IMPORTANT Be sure to properly shut down Windows 95 before shutting down the PC or Macintosh. If you repeatedly shut down the PC without shutting down Windows 95, you could damage information.

To start the PC if it's shut down, click Start PC in the PC Setup control panel.

If the PC is already running, the button is labeled Restart PC.

To restart the PC, click Restart PC in the control panel.

To restart (“warm boot”) the PC in the PC environment, use one of the following keyboard commands:

- Control-Alt (Option)-[keypad] period (the decimal point key on the numeric keypad)
- Control-Alt-⌦ (the Del key, not the Delete key)

To reset (“cold boot”) the PC in the PC environment, use one of the following keyboard commands:

- ⌘-Control-Alt-[keypad] period (the decimal point key on the numeric keypad)
- ⌘-Control-Alt-⌦ (the Del key, not the Delete key)

To shut down the PC, click Shut Down PC in the PC Setup control panel.

This option turns off the PC until you click Start PC in the PC Setup control panel.

To turn off the PC Compatibility Card entirely, click Off at the top of the PC Setup control panel; then restart your computer.

If you turn off the PC Compatibility Card, you will not be able to switch to the PC environment.

To turn the PC Compatibility Card on, click On in the PC Setup control panel and restart the Macintosh.

Starting the PC automatically

You can set the PC to start automatically when you start your computer, and you can switch to the PC environment automatically after startup. To do this, you use the PC Setup control panel.

To have the PC start automatically when you turn on your Macintosh, click Auto-start PC.

To switch to the PC environment whenever you turn on your Macintosh, click Switch at Startup.

IMPORTANT If you want to switch to the PC whenever you start up, make sure that the Shut Down Warning option is turned off in the Mac OS General Controls panel. If the warning is on, you will not be able to switch back to the Mac OS environment for a few minutes after switching to the PC.

Using floppy disk drives and floppy disks

Keep the following in mind when you use floppy disks:

- In the PC environment, the floppy disk drives are A and B.
- In the PC environment, you cannot use a Mac OS–format floppy disk. If you insert one, it will be ejected.
- To eject a floppy disk in the PC environment, press ⌘-E.
- To use an unlocked PC floppy disk with the Mac OS, you must switch to the Mac OS environment before inserting the disk. You can use a locked PC disk freely in both environments.
- In the PC environment, blank disks are formatted for the PC. In the Mac OS, you can format disks for either environment.
- Some blank disks are preformatted. If you insert a new, blank disk in the PC environment and it is ejected, it may have been preformatted in Mac OS format. To use the disk in the PC environment, you can switch to the Mac OS and format the disk for the PC. For instructions, see the documentation that came with your computer or Mac OS software upgrade kit.

Restarting the PC from a floppy disk

To restart (reboot) the PC using a floppy disk, insert a floppy disk containing operating system software into the disk drive. Press Control-Alt-⌦ to restart the PC.

Using CD-ROM discs and drives

Keep the following in mind when using CD audio discs and CD-ROM discs and drives:

- In the PC environment, press ⌘-Y to eject a disc. If the disc cannot be ejected (because a file is in use or the disc is being shared), you will hear a beep.
- You can start an audio CD in either environment and continue to listen when you switch environments. (If you start up and switch to the PC while listening to an audio CD, there may be a delay of several seconds while the PC starts up.)

- If you have more than one CD-ROM drive, the PC environment can use only the one with the lowest SCSI ID number.
- With some computer models, you can record sound from an audio CD in the PC environment. For more information, see the Sound Blaster documentation that came with your PC Compatibility Card.

Using a mouse

The standard mouse or other pointing device for Macintosh computers has one button; most PC devices have two buttons that perform different functions. If you do not have a two-button pointing device, you can purchase one from your Apple-authorized dealer. Be sure to ask for an ADB (Apple Desktop Bus) device—devices for IBM-compatible computers do not work with Macintosh computers.

You may need to install and configure mouse software to set up the mouse to work like a PC mouse. For more information, see the documentation that came with your mouse.

You can also use keyboard commands to simulate the actions of the second button. If you are using a one-button mouse, you can control it as follows:

- The button on the mouse behaves like the left button on a two-button mouse.
- To simulate pressing the right button, press the = (equal) key on the numeric keypad.
- To simulate pressing the left and right buttons at the same time, press the mouse button and the = key simultaneously.

If the software for your two-button mouse does not automatically configure your mouse or does not include a “Windows Right Mouse Button” option, you can assign the = (equal) key to the right mouse button.

In Windows, you can assign the mouse buttons to different keys using the Mouse control panel.

Using keyboards

You can use all Apple keyboards with your PC Compatibility Card.

The Option key on an Apple keyboard is the same as the Alt key in the PC environment.

On the Apple Extended Keyboard II, use the following equivalents for keys on a PC keyboard. (These equivalents also apply to the Apple Adjustable Keyboard if the function keyboard isn't plugged in.)

PC key	Macintosh keyboard equivalent
alt	option
F1 through F9	⌘-1 through 9
F10	⌘-0
F11	⌘-(minus)
F12	⌘-(equals)
F13	⌘-[
F14	⌘-]
F15	⌘-\
Home	⌘-[keypad] 7
PageUp	⌘-[keypad] 9
End	⌘-[keypad] 1
PageDown	⌘-[keypad] 3
Insert	⌘-[keypad] 0
Del	⌘-[keypad] (period)
Backspace	delete

Copying and pasting information between environments

You can exchange certain kinds of information between the Mac OS and Windows environments using the Copy and Paste commands in the Edit menu in both environments. To do this, the PC Clipboard extension must be installed in the Mac OS and the WINCLIP utility must be installed in Windows.

The PC Clipboard translates the following information formats:

- Windows CF_TEXT to/from Mac OS TEXT
- Windows RTF to/from Mac OS RTF
- Windows DIB to/from Mac OS PICT

To determine the format of material in the Mac OS, you can paste the material into the Scrapbook. In Windows, the View menu in Clipbook Viewer lists the formats that information may be converted to.

Note: Copying and pasting between DOS and Mac OS is not supported. If you want to translate information between the DOS and Mac OS environments, you can exchange files via a translation program.

When transferring information between the Mac OS and Windows, keep the following in mind:

- If you have the PC Clipboard extension installed, the Mac OS and Windows share a clipboard. That means if you copy an item to the Mac OS Clipboard, switch to Windows, and then copy an item to the Windows Clipboard, the original Mac OS Clipboard contents will be deleted.

  To prevent this, you can remove the PC Clipboard extension from the Extensions folder (inside the System Folder in the Mac OS). Removing the extension turns off clipboard translation between Mac OS and Windows.

  Note: If you remove the PC Clipboard extension, you will see an alert message every time you switch from the PC to the Mac OS.
- If you are planning to transfer information from the Mac OS Clipboard to Windows, make sure that Windows is running before you switch environments.

- Sounds cannot be transferred on the Clipboard between the Mac OS and Windows. You can use a sound translation program to transfer sound files.
- When you're in the PC environment, all Mac OS programs are put in the background and the PC Clipboard runs in the foreground. You can prevent this by removing the PC Clipboard extension from the Extensions folder (inside the System Folder in the Mac OS). Removing the extension turns off clipboard translation between the Mac OS and Windows.

  Note: If you remove the extension, you will see an alert message every time you switch from the PC to the Mac OS.
- If you have trouble pasting information between Windows and the Mac OS, try the following:
  - Assign more memory to the PC Clipboard utility and to the Mac OS application into which you are pasting information.
  - In the Macintosh Easy Open control panel, make sure the Automatic Document Translation option is turned on. To open this control panel, choose Control Panels from the Apple menu, and double-click the Macintosh Easy Open icon.
  - Save the document you're copying from in a different format. Then reopen the document and copy the material you want to move.
  - Use the Paste Special command that is available in some Windows applications. This command lets you specify the format of material you're pasting.
  - If you're pasting an image to the Win95 WordPad, try using the command Insert Object as Paintbrush Picture.
  - Images that are compressed in the Mac OS (such as Kodak Photo CD thumbnails) may display only in gray when you paste them into Windows. If this happens, try expanding the image before copying it.

Using shared folders and volumes

You can share Mac OS folders and volumes with the PC by assigning them drive letters. The MACSHARE DOS program (installed with the PC support software) makes this possible.

Note: PC applications and their files work more quickly in a drive container or on a hard disk than in a shared folder. The performance of Mac OS programs is not affected by placing them in shared folders.

IMPORTANT Information in the "resource fork" of a Mac OS file (such as an original icon) is lost when the file is copied in the PC environment, and this may damage the file. Many document files do not have resource forks and can be copied from the PC environment without problems. However, QuickTime files cannot be copied in this manner. To copy a QuickTime file, you must open it in the Mac OS using the MoviePlayer program and save it in "non-Apple computer format" before copying or using it in the PC environment.

Using PC files in the Mac OS

There are three ways to access PC files in the Mac OS:

- You can access PC files on a floppy disk. For more information, see "Using Floppy Disk Drives and Floppy Disks," earlier in this chapter.
- You can access PC files in a shared folder or volume. For information on setting up a shared area, see "Using Shared Volumes" in Chapter 5.
- You can access PC files in a PC drive container or a PC-formatted SCSI hard drive attached to your Macintosh.

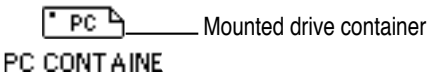
With Macintosh PC Exchange, you can see, move, and copy PC documents as icons in the Mac OS. However, you may not be able to open every kind of PC file in the Mac OS. If you can't open a file or if the file does not display properly, try one of the following:

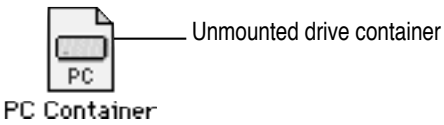
- Try opening the file using a different application program.
- Translate the document into a different file format using a file translation utility.
- If your PC program has an Export feature, use it to save the document in a different file format.
- Use a PC–Mac OS translation utility.

To gain access to files in a PC drive container from within the Mac OS, follow these steps:

1 In the Finder, double-click the drive container to open it.

The drive container appears as on the Mac OS desktop as either one of the following disk icons.





2 Double-click the container's disk icon.

The icon opens and you have access to the files inside it.

Note: If the PC is running, you can copy files from the drive container to other locations in the Mac OS, but you won't be able to add anything to the drive container or change any files in it. If you want to add or change files, you must first shut down the PC using the PC Setup control panel.

7 Troubleshooting in the PC Environment

Consult this chapter when you have questions about using the PC environment on your Macintosh.

If you have questions about using DOS, Windows, or PC application programs, see the manuals that came with your operating system software or programs.

WARNING If you have a problem with your PC compatibility hardware or software and nothing presented in this guide solves it, consult the service and support information that came with your computer for instructions on how to contact an Apple-authorized service provider or Apple for assistance. If you attempt to repair the PC compatibility hardware yourself, any damage you may cause will not be covered by the limited warranty. Contact an Apple-authorized dealer or service provider for additional information about this or any other warranty question.

Starting up

The Macintosh "hangs" or freezes during startup.

Restart the computer while holding down the Shift key to turn off extensions. After the computer starts up, restart the computer again.

The PC Setup icon has a red slash through it at startup.

You may have started the computer holding down the Shift key, which turns off extensions. Restart the computer without holding down the Shift key.

A RAM disk or RAM cache in the Mac OS may be using too much memory. Reduce the size of the RAM disk or RAM cache, and restart the computer.

The PC Setup software is not loading at startup. There may be a problem with the PC Setup Prefs file (in the Preferences folder within the System Folder). Remove the file and restart the Macintosh. Then use the PC Setup control panel to recreate your settings. If this doesn't work, try reinstalling the PC software (see Chapter 4, "Installing the PC Compatibility Card Software").

The Macintosh software for the PC Compatibility Card doesn't seem to be installed.

See Chapter 4, "Installing the PC Compatibility Card Software," for a list of the Macintosh software that is required for the PC Compatibility Card. If any of these items is missing, and you are having trouble using the PC Compatibility Card, try reinstalling the software, following the instructions in Chapter 4.

If you find the PC Setup control panel, open it. If drive C is not mapped to a drive container or hard disk drive, create a drive container (see "Creating a Drive Container" in Chapter 4).

The PC didn't start up.

Open the PC Setup control panel. Make sure the On button is selected at the top of the control panel. If it is, click Start PC at the bottom of the control panel. If the On button is not selected, click it; then restart your Macintosh. Open the PC Setup control panel again and click Start PC.

If the On button is selected and you have restarted the Macintosh, but the Switch PC, Start PC, and Shut Down PC buttons are not available, there may be a problem with your PC Compatibility Card. Consult your Apple-authorized service provider.

There may be a problem with the RAM installed on your PC Compatibility Card. Open the PC Setup control panel and check the RAM portion of the control panel. If it says No RAM, there is a problem with your RAM. Consult your Apple-authorized service provider.

DOS begins to start up but then the screen freezes. The cursor blinks, but you cannot type anything.

Press ⌘-Control-Alt-⌦ to restart the PC. When you see the message "Starting MS-DOS" or "Starting Windows 95," press and hold one of the following keys to bypass your CONFIG.SYS and AUTOEXEC.BAT files:

DOS or Windows: Press and hold the Shift key.

Windows 95: Press and hold the F5 key.

After the PC has started up, check the files, change any incorrect lines (such as the EMM386 line), and then restart the PC.

In Windows 95, you can also hold down the F8 key to step through the files line by line. Usually the PC freezes immediately after a problematic line.

Switching to and from the PC

There is a delay when switching between environments.

If you have the internal audio/video assembly installed, there is a delay of several seconds when you switch to the PC and the PC still needs to start up. There is also a delay when you switch to the PC immediately after starting it or when you use the ⌘-Control-Alt-⌦ command to perform a hard restart. The PC is performing some system configuration tasks.

When switching would interfere with a Mac OS system task, there is a slight delay until the task is completed.

There also may be a delay while a large amount of Clipboard information is transferred.

If you are switching to the PC immediately after starting up the computer, make sure the Shut Down Warning is turned off in the General Controls panel in the Mac OS. If it is on, you may not be able to switch back to the Mac OS for several minutes after switching to the PC.

When I switch to the Mac OS from the PC environment, a message appears: "PC Clipboard requires additional system services in order to function. Please ensure that the PC Compatibility Card is successfully installed."

Macintosh Easy Open software may be turned off or may not be installed. Restart the computer, open the Macintosh Easy Open control panel, and make sure the software is turned on. If you can't find the control panel, reinstall it from the *PC Compatibility Card Mac OS Software* CD.

In the PC environment, I see the message "Non-system disk or disk error. Replace and strike any key when ready."

The PC Compatibility Card can't find operating system software such as DOS or Windows.

A nonbootable floppy disk may be in the floppy disk drive. Press ⌘-E to eject the disk; then try starting the PC again.

Make sure drive C is mapped to a drive container or hard disk drive that contains DOS or Windows software.

If you can't find a drive container, the PC software may not be installed. See Chapter 4, "Installing the PC Compatibility Card Software."

Display problems

See also the troubleshooting section in Appendix C, “Configuring Video Software.”

When I try to switch to the PC environment, my screen is blank or garbled.

Open the PC Setup control panel and check the Display portion of the control panel.

If you see the message “Not Supported,” your monitor may not be compatible with the PC Compatibility Card. Refer to Appendix C, “Configuring Video Software,” for monitor specifications and video modes, and check with your monitor vendor to see if your monitor conforms to these specifications.

If you see the message “Unknown,” PC Setup does not recognize your monitor type, but you may be able to configure your video software to identify the monitor. See Chapter 4, “Installing the PC Compatibility Card Software” and Appendix C, “Configuring Video Software.”

If you see the message “No Display,” your monitor may not be connected properly. Make sure your monitor is connected according to the instructions in the chapter for installing the card in your computer model and Chapter 3, “Connecting Monitors and Other Equipment.”

If you’re using a VGA monitor connected to a VGA-to-Macintosh adapter, you may be able to reconfigure the adapter to send the correct signal to the Macintosh. Check the documentation that came with your monitor and adapter.

Make sure that you’ve configured your video software correctly. The PC Compatibility Card does not support resolutions greater than 1280 x 1024. For more information, see Chapter 4, “Installing the PC Compatibility Card Software” and Appendix C, “Configuring Video Software.”

The PC Setup Prefs file may be damaged. Locate the file (in the Preferences folder inside the System Folder) and throw it away; then restart the Macintosh. When the computer starts up, open the PC Setup control panel and verify the settings.

I tried configuring my display and now it won't work properly.

In Windows 95, if you choose a configuration that won't display properly, follow these steps to correct the problem:

1. Switch to the Mac OS by typing ⌘-Return.
2. In the PC Setup control panel, click Restart PC.
3. Switch to the PC by clicking Switch to PC.
4. When you see the message "Starting Windows 95," press <F8> to enter Safe Mode.
5. When Windows 95 starts up, click Start, choose Settings, and click Control Panel.
6. Double-click the Display icon.
7. Click the Settings tab, and select a correct monitor setting in the list that appears (such as 640x480). Then restart Windows.

My monitor flashes oddly when I switch environments.

When you are using a single monitor for both environments, there is a flash when you switch from one environment to the other. If you prefer not to see the flash, turn on the Fade Screens option in the PC Setup control panel.

When I start up certain software in the PC environment, my Apple monitor shows a jumbled or rolling image.

You may have selected the wrong monitor type when configuring your video software. For more information, see Chapter 4, "Installing the PC Compatibility Card Software."

Some application programs that write directly to the hardware (especially games) may not work with some monitors. Contact the software company and ask if the software has a switch to force it to make BIOS calls.

Problems with files and disks

I want to assign a drive container to the C or D drive, but I can't find the drive container in the dialog box.

The drive container may be assigned to another drive letter. Check the C: and D: pop-up menus.

I want my drive container to have more than one partition.

Create a new drive container following the instructions in "Changing the Size of a Drive Container" in Chapter 5. Initialize the drive container in DOS using the FDISK and FORMAT commands.

I can't share all the folders I want.

Make sure that you have sufficient drive letters assigned in your CONFIG.SYS file's LASTDRIVE statement. The PC reserves the letters A–E; other letters are available to be assigned to shared folders or volumes.

Novell Netware may reassign drive letters even if you have assigned them to shared folders. Try reserving additional drive letters and reassigning your shared folders.

I inserted a floppy disk in the PC environment and it was ejected.

The disk may have been formatted for the Mac OS. Switch to the Mac OS and try inserting the disk again.

I inserted a PC-formatted disk in the Mac OS and an initialization message appeared.

Macintosh PC Exchange may not be installed in the Control Panels folder. If you don't find it, you can reinstall it using your system software CD-ROM disc.

The disk may be damaged. Try inserting another disk. If that works, test the original disk in the PC environment using a disk repair utility.

I switched to the Mac OS, and I don't see the floppy disk I was using.

The floppy disk may not have been locked. To use an unlocked PC-formatted floppy disk in the Mac OS, you must switch to the Mac OS before inserting the disk.

I can access a floppy disk from one environment but not the other.

Only a locked floppy disk can be accessed in both environments simultaneously. Eject, lock, and reinsert the disk, or eject the disk, switch to the environment you want to use it in, and reinsert the disk. The disk must be formatted for the PC if you want to use it in the PC environment.

Shared folders don't get updated in Windows 95.

Sometimes you need to refresh shared folders manually in Windows 95. Click My Computer, click View; then click Refresh once or twice.

In some Microsoft application programs, a shared drive icon looks like a floppy disk or CD icon.

The shared drive is still usable.

Problems with information transfer

Copying and pasting between environments isn't working.

Only certain kinds of information can be copied and pasted. See "Copying and Pasting Information Between Environments" in Chapter 6 for more information.

Copying and pasting between the Mac OS and Windows works only if the PC Clipboard extension is installed in the Extensions folder inside the System Folder (in the Mac OS) and WINCLIP is installed in the Windows environment.

Check the Control Panels folder in your System Folder to make sure that the Macintosh Easy Open control panel is installed. Also, make sure the Automatic Document Translation option in the control panel is turned on. To open the Macintosh Easy Open control panel, choose Control Panels from the Apple menu, and double-click the Macintosh Easy Open icon.

Windows must be running before you begin the copy-and-paste operation.

You cannot copy and paste between the Mac OS and DOS.

I can't copy files from the Mac OS to a drive container currently in use by the PC.

You cannot copy files while the PC is running. Shut down the PC and try copying the files again.

I can't connect to a network in the PC environment.

Make sure that your networking software is properly installed and configured (see the section on installing network support for Windows or Windows 95 in Chapter 4, "Installing the PC Compatibility Card Software," and see Appendix B, "Installing Network Client Software").

Make sure the network is up and running (check the Chooser and check with your network administrator).

On some Macintosh models (for example, Power Macintosh 7200/75, 7200/90, 7500/100, 8500/120, 9500/120, 9500/132), you cannot use the same networking protocol simultaneously in the PC and the Mac OS. Make sure that different networking protocols are selected in the Mac OS and PC environments. Some models allow you to use TCP/IP simultaneously in both environments.

My PC communications software doesn't work.

The Macintosh and the PC use slightly different serial port protocols, and some commands do not work. See "Setting Up a Modem or Other Serial Device" in Chapter 5.

Configuration problems

I can't assign RAM from my Macintosh to the PC.

Your PC Compatibility Card can only use RAM installed on the card. You cannot assign it RAM from your Macintosh. You can increase the RAM in the PC Compatibility Card by adding a DIMM or replacing the existing DIMM with a larger DIMM. For instructions, see Appendix A, "Adding Memory to a PC Compatibility Card."

I can't assign a COM port to a Macintosh serial port.

COM ports cannot be assigned to Macintosh serial ports that are in use by an application or network software.

If you assign a COM port to a Macintosh serial port, the serial port cannot be used by the Mac OS until you unassign the COM port and restart your PC.

Sound problems

I can't install Sound Blaster software.

Before you can install Sound Blaster software, you may need to make a temporary change to your AUTOEXEC.BAT file in order to free enough memory for the install utility. Open the AUTOEXEC.BAT file in a text editor and edit the line containing the word "SMARTDRV" as shown:

```
REM C:\DOS\SMARTDRV.EXE
```

Restart the PC by pressing Control-Alt-⌦, and try the installation again.

Be sure to restore the "SMARTDRV" line in the AUTOEXEC.BAT file to its original state after Sound Blaster installation is successful.

I can't hear PC sounds.

PC sound may be turned off in the PC Setup control panel, or the appropriate sound input options may not be selected in the Mac OS. Consult the documentation that came with your computer or system software upgrade kit.

If you can't hear sound from a CD, make sure that the internal CD audio cables are installed according to the instructions in the chapter on installing the PC Compatibility Card in your computer model.

The PC Compatibility Card can play sound only from the CD-ROM drive with the lowest SCSI ID number. If you're using another CD-ROM drive, you won't hear sound when you switch to the PC environment.

If you are using DOS or Windows, increase the speaker volume with the Sound Blaster Mixerset application. To run the Mixerset application from DOS, change to the VIBRA16 directory, type `mixerset`, and press Enter.

Check that the AUTOEXEC.BAT and CONFIG.SYS files contain the following lines:

AUTOEXEC.BAT (for Windows 95)

```
SET SOUND=C:\PROGRA~1\CREATIVE\CTSND
SET BLASTER=A220 I5 D1 H5 P330 T6
SET MIDI=SYNTH:1 MAP:E
```

AUTOEXEC.BAT (for Windows)

```
SET SOUND=C:\VIBRA16
SET BLASTER=A220 I5 D1 H5 P330 T6
SET MIDI=SYNTH:1 MAP:E
C:\VIBRA16\DIAGNOSE /S
C:\VIBRA16\MIXERSET.EXE /P /Q
```

CONFIG.SYS (for Windows 95 or Windows)

```
DEVICE=C:\VIBRA16\DRV\VIBRA16.SYS /UNIT=0 /BLASTER=A:220
I:5 D:1 H:5
DEVICE=C:\VIBRA16\DRV\CTMMSYS.SYS
```

CD sound went away when I switched environments.

If you are playing an audio CD when you start the PC and switch environments, there is a delay in the sound while the PC completes some system configuration tasks.

Check that the CONFIG.SYS file contains this line:

```
DEVICEHIGH=C:\APPLE\CDROM.SYS/D:CDDRVR
```

Check that the AUTOEXEC.BAT file contains this line:

For Windows 95:

```
LOADHIGH C:\WINDOWS\COMMAND\MSCDEX.EXE /D:CDDRVR/L:E
```

For Windows:

```
LOADHIGH C:\DOS\MSCDEX.EXE /D:CDDRVR/L:E
```

I'm using Windows or Windows for Workgroups, and I can't play audio CDs with the Media Player or Ensemble CD utilities.

Reinstall the MCI CD Audio driver from your original Windows installation disks. To install this driver, open the Control Panel icon in the Main program group. Double-click the Drivers icon, and click the Add button in the window that appears. Select "[MCI CD Audio]" from the scroll list and click OK. Insert the specific Windows installation disk if necessary.

Printing problems

Printing doesn't work.

Make sure that you've selected the correct preferences in PC Print Spooler (in the Extensions folder inside the System Folder). If your printer does not support PostScript, choose Epson.

Make sure that you have chosen appropriate printer drivers in your DOS applications and your Windows environment. If you have a PostScript Level 1 (black-and-white) printer, you must choose a PostScript Level 1 printer driver in Windows—a driver for a Level 2 printer will not work.

Make sure a printer is selected in the Macintosh Chooser.

If you're using Windows, make sure that bidirectional printing and the "Check port before printing" options are turned off. If you're printing to a PostScript printer, make sure that the "Send Ctrl+D" feature is turned off.

For more information, see "Setting Printer Options" in Chapter 5.

When I try to print from the DOS prompt, I get an error message.

If you're using PostScript emulation, open PC Print Spooler in the Extensions folder (inside the System Folder). Choose Preferences from the File menu. Make sure the checkbox labeled "Print non-PostScript as Epson" has an X in it. Switch to DOS and try printing again (or move the spool file from the Spooler Rejected folder to the Spooler folder).

When I print a document in the PC environment, the top and bottom get clipped.

If you're using Epson emulation, open PC Print Spooler in the Extensions folder, choose Preferences from the File menu, and click "Gaps between pages." In the PC environment, configure your applications to print to a 60-line page.

You cannot print to legal-size paper from the PC environment using the PC Print Spooler. You can print only to the default paper size in the Mac OS Page Setup dialog box (US Letter in the U.S.).

When I print a document from a DOS application, the fonts don't look right.

Try choosing different fonts. If you're using Epson fonts instead of bitmap fonts, use monospace fonts for best formatting results.

If you're using Epson emulation, you may have chosen Faster Printing in the Preferences dialog box of the PC Print Spooler, which prints the whole document using a single font. Choose Better Quality and try printing again.

You may have selected a proportional space font as your default font in the PC Print Spooler. If you select a proportional space font, the formatting of your files may change. Try selecting a monospace font such as Courier or Monaco or using the graphical fonts available in your DOS application.

Other problems

I'm running applications in both environments and they seem sluggish.

Significant drive access in one environment (including file sharing) can cause a slowdown in the other.

The PC environment is frozen, and pressing Control-Alt-⌦ doesn't reset the system.

Try restarting by pressing ⌘-Control-Alt-[keypad] period (the decimal point on the numeric keypad) or ⌘-Control-Alt-⌦. If you can, switch to the Mac OS and click Restart PC in the PC Setup control panel. If these options don't work, reset the Macintosh using the Reset key or keyboard command.

I can't configure my mouse.

You don't need to configure some mouse devices.

If you have a two-button ADB mouse or trackball, you may be able to use the mouse software to map the = (equal) key on the numeric keypad to the right-mouse button.

Appendix A
Adding Memory to a PC Compatibility Card

Your PC Compatibility Card has one socket available for RAM (random access memory). Some versions of the card come with a DIMM (dual inline memory module) already installed. On these cards, you can increase memory by replacing the installed DIMM with a greater-capacity DIMM.

Some versions of the PC Compatibility Card do not come with an installed DIMM. On these cards, you must install a DIMM in the socket prior to installing the card in your computer. Otherwise, the card will not work.

The memory you install on your PC Compatibility Card is for the exclusive use of your PC. Generally, a larger-capacity DIMM will provide better performance than one of lower capacity. The DIMM socket accepts an 8, 16, 32, or 64 MB DIMM. For more information, see Appendix D, "Technical Information."

If your PC Compatibility Card is already installed, installing memory on the card involves the following steps:

- opening the computer
- removing the card
- removing the existing DIMM, if one is installed
- installing the new DIMM
- replacing the card
- closing the computer

If the card is not installed, you need only remove the existing DIMM (if one is installed), install the new DIMM, install the card, and close the computer.

Opening the computer

1 **Turn off the computer.**

Make sure the computer is plugged in but turned off.

2 **Remove the lid from the computer.**

For detailed instructions, see the earlier chapter in this manual on installing the PC Compatibility Card in your computer model.

Removing the card

For detailed instructions, see the earlier chapter in this manual on installing the PC Compatibility Card in your computer model.

1 **If you haven't already done so, remove the loopback cable from the port on the back of the PC Compatibility Card.**

2 **Touch the metal part of the power supply case inside the computer to discharge any static electricity that might be on your clothes or body.**

Always do this before you touch any parts or install any components inside the computer.

3 **Locate the PC Compatibility Card.**

4 **Disconnect the cables attached to the card. Be sure to pull the connectors, not the cables.**

Remember where the cables were attached so you can replace them later.

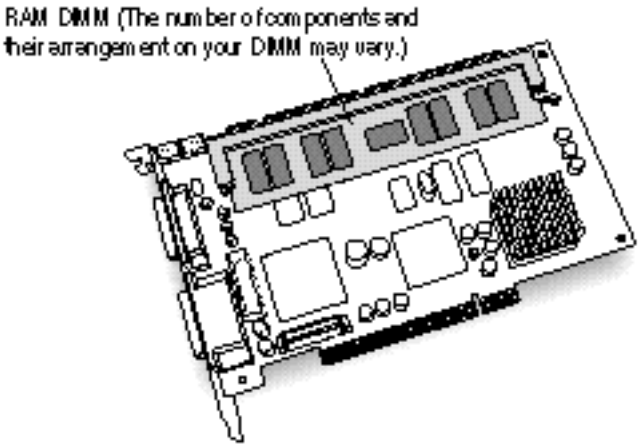
5 **Remove the card by firmly lifting it straight up.**

Grasp the card by its sides to remove it.

IMPORTANT Do not rock the card side to side as you remove it. Doing so may break the card or damage the slot.

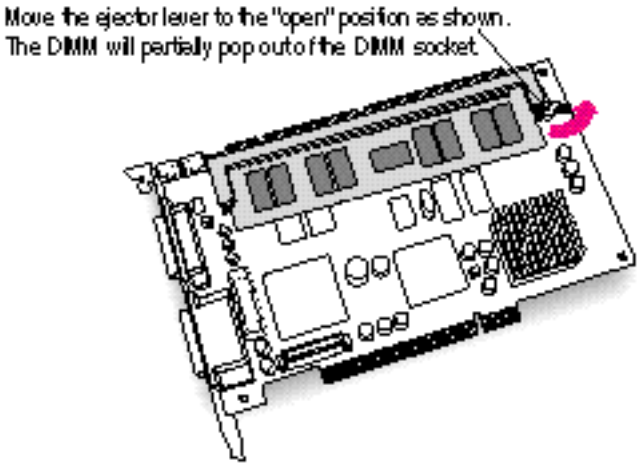
Removing the old DIMM

1 **Determine if there is a DIMM in the DIMM slot.**



If there is no DIMM in the slot, skip the next step and go to the next section, "Installing the New DIMM."

2 **Gently push the DIMM lever until it snaps open.**

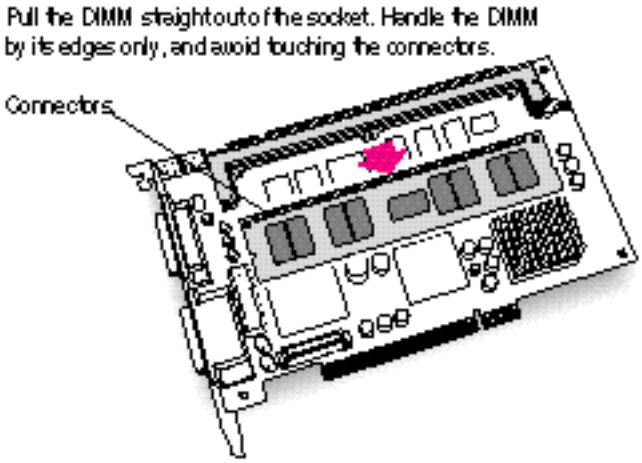


3 **Pull the DIMM to remove it.**

If the DIMM sticks, pull gently, but don't force the DIMM.

Be careful not to touch the connectors.

Set the DIMM aside. (If you wish, you may be able to install it in your computer later. It's compatible with most Macintosh models.)



Installing the new DIMM

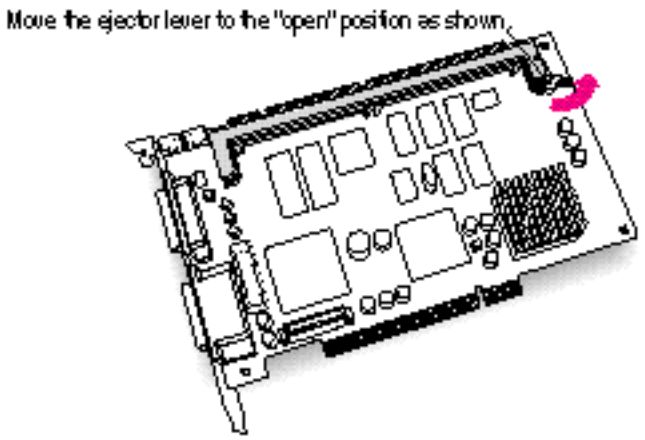
1 **Remove the new DIMM from its static-proof bag.**

Handle the DIMM by its edges. Avoid touching the connectors.

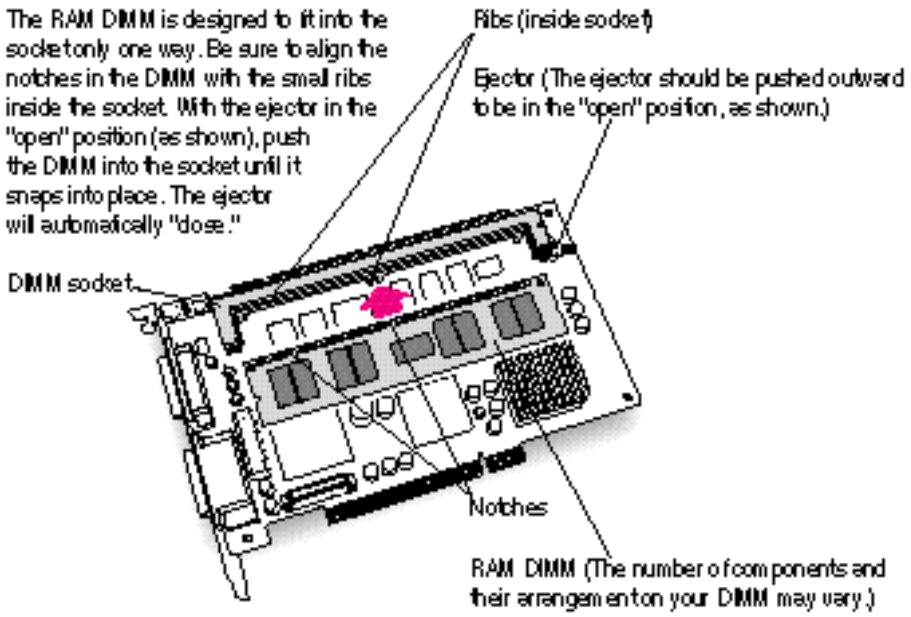
You may want to put the old DIMM in the static-proof bag until you want to use it again.

2 **Make sure the DIMM lever is in the open position.**

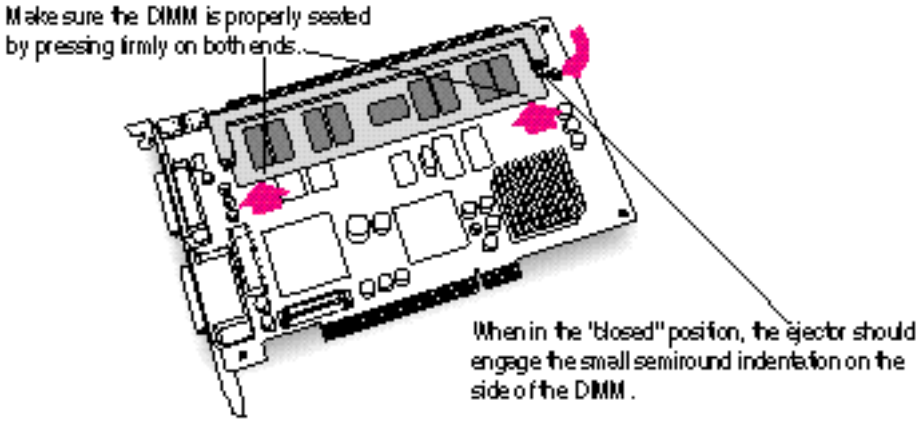
If not, gently push the DIMM lever until it snaps open.



3 **Push the DIMM into the DIMM slot until the lever snaps into the closed position.**



4 **Make sure the DIMM is snapped into place on both ends.**



Reinstalling the card

For more detailed instructions, see the section earlier in this manual that describes installing the card in your model of computer.

1. **Reconnect the cables to the card as they were before you began this process.**

   For detailed instructions on connecting the CD audio cables, see the section on installing the PC Compatibility Card in your computer model.

2. **Insert the card into the slot you removed it from.**

3. **Make sure the cables are out of the way so that you can replace the computer cover easily.**

4. **Close the computer.**

5. **Reconnect the computer's cables.**

   Your PC Compatibility Card is now fully installed with extra memory, and is ready to use.

Appendix B
Installing Network Client Software

The PC Compatibility Card inside your computer supports network drivers that conform to Novell's Open Data-Link Interface (ODI) and Microsoft's Network Driver Interface Specification (NDIS) v.2.0. This appendix describes how to install and configure a variety of network protocol software and client software.

Use this chapter as a supplement to the documentation that came with your network software. If your configuration still doesn't work after following the instructions in this appendix, contact the manufacturer of your network software.

This chapter contains instructions for installing and setting up the following network software combinations.

ODI driver with the following protocols

- NetBEUI and IPX/SPX in Windows 95
- TCP/IP in Windows 95
- NetBEUI in Windows for Workgroups
- IPX/SPX in Windows for Workgroups
- Microsoft's TCP/IP-32 IP in Windows for Workgroups
- Trumpet WinSock in Windows for Workgroups (packet driver)
- Spry's Air Series TCP/IP in Windows for Workgroups
- AppleShare for Windows in Windows for Workgroups
- Novell's LAN WorkPlace for DOS TCP/IP software

NDIS 2.0 driver with the following protocols

- NetBEUI and IPX/SPX in Windows 95
- Microsoft's TCP/IP and IPX/SPX in Windows 95
- NetBEUI and IPX/SPX in Windows for Workgroups
- Microsoft's TCP/IP in Windows for Workgroups
- Client software for an OS/2 LAN Server in DOS, Windows, or Windows for Workgroups
- Banyan Vines in DOS

Either the ODI or NDIS 2.0 driver with the following protocol

- NetManage's Chameleon TCP/IP in Windows for Workgroups

If you are installing a protocol for use with an ODI driver, See "Installing Protocols for Use With Open Data-Link Interface (ODI)," next. If you are installing a protocol for use with an NDIS 2.0 driver, see "Installing Protocols for Use With Network Driver Interface Specification (NDIS) 2.0," later in this appendix.

Installing protocols for use with Open Data-Link Interface (ODI)

Before you install a protocol for use with ODI, follow the steps in the next section to install the NetWare client software. Then refer to the instructions later in this section that describe installing and setting up the network protocol you want to use.

Installing NetWare client software

Install NetWare client software before installing any ODI-compatible protocol.

Note: If you are installing Windows for Workgroups, the Novell NetWare client, and TCP/IP support, it is easiest if you install the NetWare client first, Windows for Workgroups second, and TCP/IP support third.

You need to know the Ethernet frame type in use on your network segment. Your network administrator can give you this information.

1 **Start the NetWare Client Install program and follow the instructions on screen for steps 1–3.**

2 **Select step 4.**

A list of network interface controller (NIC) drivers appears.

3 **Select Other Drivers and press Enter.**

4 **Insert the disk containing the NetWare client software and select Power Macintosh 6100 Ethernet Adapter.**

5 **Follow the instructions to select the proper frame type and to finish the installation.**

Make sure your configuration files include the following:

CONFIG.SYS

```
FILES=40
STACKS=9,256
LASTDRIVE=Z
DEVICE=C:\Apple\CDROM.SYS /D:CDDRVR
```

AUTOEXEC.BAT

```
@CALL C:\NWCLIENT\STARTNET
PROMPT $P$G
PATH C:\WINDOWS;C:\DOS
PATH=C:\NWCLIENT\;%PATH%
```

STARTNET.BAT

```
@ECHO OFF
C:
CD \NWCLIENT
SET NWLANGUAGE=ENGLISH
LSL
MACODI.COM
IPXODI
VLM
CD \
```

NET.CFG

```
LINK DRIVER MACODI
   FRAME ETHERNET_802.2
```

Using ODI drivers with NDIS compatible protocols

If you will be using ODI drivers with NDIS compatible protocols, you need a translator file. Microsoft's NDIS to ODI translator, ODIHLP.EXE, is automatically installed with Windows for Workgroups 3.11 if you indicate you will be using ODI drivers.

If you will be using both Novell NetWare and Windows for Workgroups 3.11, you should use ODIHLP.EXE instead of Novell's equivalent file, ODINSUP.COM (included with NetWare).

If you use ODINSUP.COM, you must change the NET.CFG file to specify an interrupt. Add the statement `INT 6` to the Link Driver section of the NET.CFG file.

Conserving memory

The line `CALL C:\NWCLIENT\STARTNET.BAT` in the AUTOEXEC.BAT file loads four programs into DOS memory—LSL.COM, MACODI.COM, IPXODI.COM, and VLM.EXE (in this order). To conserve memory in the lower DOS region, you may wish to edit the STARTNET.BAT file to load those four programs with the LOADHIGH (LH) command. See your DOS documentation for more details on manually optimizing DOS memory.

Installing NetBEUI and IPX/SPX in Windows 95

This section describes how to install the NetBEUI and IPX/SPX protocols for use with an ODI driver in Windows 95. If you are using NDIS 2.0, refer to this topic in "Installing Protocols for Use With NDIS 2.0" later in this appendix.

1. **Install the NetWare client software.**

   For more information, see "Installing NetWare Client Software" earlier in this appendix.

2. **In Windows 95, click Start, choose Settings, and then choose Control Panel from the menu that appears.**

3. **Double-click the Network Icon in the Control Panel.**

4. **Click Add in the Network Configuration dialog box.**

5. **Select Adapter Component from the Network Component list, and then click Add.**

6 **In the Manufacturers list, select Detected Net Drivers.**

7 **In the Network Adapters list, select Existing ODI Driver, and then click OK.**

The Network Configuration dialog box appears.

8 **To share files or your printer with other users on the network, click the File and Print Sharing button.**

9 **Select the checkboxes in the dialog box to enable file or printer sharing, and then click OK.**

If file or printer sharing has been selected, "File and printer sharing for Microsoft Networks" will appear in the Network Configuration dialog box.

10 **Select the Identification tab at the top of the network configuration box.**

11 **Type in a unique name, work group name, and any description you would like for the computer.**

The computer must have a unique name to access the network. The work group name is usually "WORKGROUP."

12 **Click OK.**

13 **Insert the Windows 95 installation CD-ROM or disk when prompted to do so.**

14 **When the System Settings Change dialog box prompts you to restart your computer, click No.**

15 **Refer to "Running the Network Protocol Setup (SETNET) Utility" near the end of this appendix and follow the instructions there.**

Installing TCP/IP in Windows 95

This section describes how to install the TCP/IP protocol for use with an ODI driver in Windows 95. If you are using NDIS 2.0, refer to this topic in "Installing Protocols for Use With NDIS 2.0" later in this appendix.

1 **Install the NetWare client software.**

For more information, see "Installing NetWare Client Software" earlier in this appendix.

2 **In Windows 95, click the Start button, choose Settings, and then choose Control Panel from the menu that appears.**

3 **Double-click the Network Icon in the Control Panel.**

4 **Click Add in the Network Configuration dialog box.**

5 **Select Adapter Component from the Network Component list, and then click Add.**

6 **In the Manufacturers list, select Detected Net Drivers.**

7 **In the Network Adapters list, select Existing ODI Driver, and then click OK.**

The Network Configuration dialog box appears.

8 **Click Add.**

9 **Double-click the Protocol icon.**

10 **In the Manufacturers area, select Microsoft. In the Network Protocols area, select TCP/IP.**

11 **To share files or your printer with other users on the network, click the File and Print Sharing button.**

12 **Select the checkboxes in the dialog box to enable file or printer sharing, and then click OK.**

If file or printer sharing has been selected, "File and printer sharing for Microsoft Networks" will appear in the Network Configuration dialog box.

13 **Select the Identification tab at the top of the network configuration box.**

14 **Type in a unique name, work group name, and any description you would like for the computer.**

The computer must have a unique name to access the network. The work group name is usually "WORKGROUP."

15 **Click OK.**

16 **Insert the Windows 95 installation CD-ROM or disk when prompted to do so.**

17 **When the System Settings Change dialog box prompts you to restart your computer, click No.**

18 **Refer to "Running the Network Protocol Setup (SETNET) Utility" near the end of this appendix and follow the instructions there.**

Installing NetBEUI in Windows for Workgroups

This section describes the settings necessary to install the NetBEUI protocol for use with an ODI driver in Windows for Workgroups. If you are using NDIS 2.0, refer to this topic in "Installing Protocols for Use With NDIS 2.0" later in this appendix.

1 **Install the NetWare client software.**

For more information, see "Installing NetWare Client Software" earlier in this appendix.

2 **In Windows, open the Network Setup control panel and select NetBEUI.**

3 **Make sure MACODI.COM is in the \NWCLIENT directory.**

4 **Refer to "Running the Network Protocol Setup (SETNET) Utility" near the end of this appendix and follow the instructions there.**

5 **Make sure your configuration files contain the following:**

NET.CFG

```
LINK DRIVER MACODI
   FRAME ETHERNET_802.3
   FRAME ETHERNET_II
   FRAME ETHERNET_802.2
   FRAME ETHERNET_SNAP
  PROTOCOL NETBEUI  F0 ETHERNET_802.2
NETWARE DOS REQUESTER
   FIRST NETWORK DRIVER = F
```

AUTOEXEC.BAT (must begin with the following lines in this order)

```
C:\WINDOWS\NET START
@CALL C:\NWCLIENT\STARTNET
C:\WINDOWS\ODIHLP.EXE
```

PROTOCOL.INI

```
[NETWORK.SETUP]
   VERSION=0X3110
   NETCARD=MS$ODIMAC,1,MS$ODIMAC,4
   TRANSPORT=MS$NETBEUI,NETBEUI
   LANA0=MS$ODIMAC,1,MS$NETBEUI
[LINK DRIVER MACODI]
   DATA=FRAME ETHERNET_SNAP
   DATA=FRAME ETHERNET_802.2
   DATA=FRAME ETHERNET_II
   DATA=FRAME ETHERNET_802.3
[NET.CFG]
   PATH=C:\NWCLIENT\NET.CFG
[MS$ODIMAC]
   PROTOCOLDOT2=F0
[NETBEUI]
   BINDINGS=MACODI
   LANABASE=0
   SESSIONS=10
   NCBS=12
```

Installing IPX/SPX in Windows for Workgroups

This section describes the settings necessary to install the IPX/SPX protocol for use with an ODI driver in Windows for Workgroups.

Installing ODI drivers in Windows for Workgroups adds two commands to the AUTOEXEC.BAT file:

- `NET START` initializes the Windows network functions
- `ODIHLP.EXE` calls Microsoft's ODI to NDIS translation file

IMPORTANT The Windows for Workgroups Network Browser requires more than 540K of conventional memory. You should maximize conventional memory by removing unnecessary device drivers and TSRs and by loading the remaining device drivers and TSRs into high memory, if possible.

1. **Install the NetWare client software.**

   For more information, see "Installing NetWare Client Software" earlier in this appendix.

2. **In the Network Setup control panel, select Drivers, select Add Adapter, and select "IPXODI Support Driver (Ethernet)."**

3. **Select "IPX/SPX Compatible Transport With NetBIOS."**

4. **Select your frame type.**

5. **Set the default protocol.**

6. **If you installed NetWare, you're asked you if you want to replace the Novell NetWare drivers. Answer no.**

7. **Refer to "Running the Network Protocol Setup (SETNET) Utility" near the end of this appendix and follow the instructions there.**

8. **Verify that your configuration files contain the following information.**

   After following the above instructions, your configuration files should contain the information shown below, assuming a frame type of ETHERNET_802.2 and that NetBEUI is not installed.

   NET.CFG

```
LINK DRIVER MACODI
   FRAME ETHERNET_802.2
   FRAME ETHERNET_802.3
   FRAME ETHERNET_SNAP
   FRAME ETHERNET_II
   PROTOCOL IPX EO ETHERNET_802.2
```

AUTOEXEC.BAT

```
C:\WINDOWS\NET START
@CALL C:\NWCLIENT\STARTNET
C:\WINDOWS\ODIHLP.EXE
@ECHO OFF
LH C:\DOS\SMARTDRV.EXE /X
PROMPT $P$G
PATH C:\WINDOWS;C:\DOS
PATH=C:\NWCLIENT\;%PATH%
LH C:\APPLE\APPLEPC
LH C:\APPLE\MACSHARE
LH C:\DOS\MSCDEX /D:CDDRVR /L:E
SET TMP=C:\TEMP
```

PROTOCOL.INI

```
[NETWORK.SETUP]
   VERSION=0X3110
   NETCARD=MS$ODIMAC,1,MS$ODIMAC,4
   TRANSPORT=MS$NWLINKNB,NWLINK
   LANA0=MS$ODIMAC,1,MS$NWLINKNB

[NET.CFG]
   PATH=C:\NWCLIENT\NET.CFG

[MS$ODIMAC]
   [LINK DRIVER MACODI]
   DATA=FRAME ETHERNET_SNAP
   DATA=FRAME ETHERNET_802.2
   DATA=FRAME ETHERNET_II
   DATA=FRAME ETHERNET_802.3
   DATA=LINK DRIVER MACODI

[NWLINK]
   BINDINGS=MACODI
   FRAME=ETHERNET_802.2
```

Installing Microsoft's TCP/IP-32 IP protocol stack in Windows for Workgroups

Follow these steps to set up Microsoft's TCP/IP-32 IP protocol stack for use with an ODI driver in Windows for Workgroups.

1. **Install the NetWare client software.**

   For more information, see "Installing NetWare Client Software" earlier in this appendix.

2. **Install the protocol stack following the instructions that came with it.**

3. **Refer to "Running the Network Protocol Setup (SETNET) Utility" near the end of this appendix and follow the instructions there.**

4. **After running SETNET, make sure the NET.CFG and PROTOCOL.INI files contain the sections shown below.**

   The following entries assume that IPX/SPX support is loaded.

   NET.CFG

```
LINK DRIVER MACODI
   FRAME ETHERNET_802.2
   FRAME ETHERNET_802.3
   FRAME ETHERNET_II
   FRAME ETHERNET_SNAP
   PROTOCOL IPX E0 ETHERNET_802.2
   PROTOCOL IP 800 ETHERNET_II
   PROTOCOL ARP 806 ETHERNET_II
   PROTOCOL RARP 8035 ETHERNET_II

LINK SUPPORT
   MAX BOARDS 4
   BUFFERS 4 1500
   MEMPOOL 4095
```

PROTOCOL.INI

```
[NETWORK.SETUP]
VERSION=0X3110
NETCARD=MS$ODIMAC,1,MS$ODIMAC,4
TRANSPORT=MS$NWLINKNB,NWLINK
TRANSPORT=TCPIP-32N,MSTCP32
LANA0=MS$ODIMAC,1,MS$NWLINKNB
LANA1=MS$ODIMAC,1,TCPIP-32N

[NET.CFG]
PATH=C:\NWCLIENT\NET.CFG

[MS$ODIMAC]
[LINK DRIVER MACODI]
DATA=FRAME ETHERNET_SNAP
DATA=FRAME ETHERNET_802.2
DATA=FRAME ETHERNET_II
DATA=FRAME ETHERNET_802.3
DATA=LINK DRIVER MACODI

[NWLINK]
BINDINGS=MACODI
FRAME=ETHERNET_802.2

[MSTCP32]
BINDINGS=MACODI
LANABASE=1
```

Installing Trumpet WinSock in Windows for Workgroups

This section describes how to set up the Trumpet WinSock protocol for use with an ODI driver in Windows for Workgroups.

1 **Install the NetWare client software.**

For more information, see "Installing NetWare Client Software" earlier in this appendix.

2 **Gather all the files necessary for installing Trumpet WinSock, including:**

- TCPMAN.EXE
- TRUMPWSK.INI
- WINSOCK.DLL
- WINPKT.COM
- ODIPKT.COM

3 **Make sure that all the Trumpet WinSock files are in the directory C:\TRUMPET.**

4 **Refer to "Running the Network Protocol Setup (SETNET) Utility" near the end of this appendix and follow the instructions there.**

5 **After running SETNET, make sure your NET.CFG file and the batch file you use to call the networking software contain the following entries:**

NET.CFG

```
LINK DRIVER MACODI
   FRAME ETHERNET_802.2
   FRAME ETHERNET_802.3
   FRAME ETHERNET_SNAP
   FRAME ETHERNET_II
   PROTOCOL IPX E0 ETHERNET_802.2
   PROTOCOL IP 800 ETHERNET_II
   PROTOCOL ARP 806 ETHERNET_II
   PROTOCOL RARP 8035 ETHERNET_II
LINK SUPPORT
   BUFFERS 8 1600
   MEMPOOL 4095
```

AUTOEXEC.BAT

```
C:\NWCLIENT\LSL.COM
C:\NWCLIENT\MACODI.COM
C:\NWCLIENT\IPXODI.COM
C:\TRUMPET\ODIPKT.COM  3 107
C:\TRUMPET\WINPKT.COM 107
```

You may also include the AUTOEXEC.BAT lines in STARTNET.BAT. If you do so, be sure to include the following pointer to STARTNET.BAT. from your AUTOEXEC.BAT file:

```
@CALL [PATH]\STARTNET
```

Note: LSL.COM is the link support layer driver supplied by Novell client software. MACODI.COM is the network interface driver supplied by Apple. IPXODI.COM is the IPX/SPX protocol stack layer supplied by Novell client software. ODIPKT.COM is the ODI packet driver supplied by InterCon software. The first number represents the frame type, as listed in the NET.CFG file. Ethernet_II is the last of four frame types (the first is number 0). The second number is the "line number" and should always be set to 107 for Ethernet. WINPKT.COM is the Windows virtual packet driver. It takes as an argument the line number for the packet driver.

Installing Spry Air Series TCP/IP in Windows for Workgroups

This section describes how to install the Spry Air Series TCP/IP protocol for use with an ODI driver in Windows for Workgroups.

IMPORTANT If you have not already installed TCP/IP client software such as Microsoft TCP/IP-32 or Trumpet Winsock, install it before you install the Air Series software.

If you are using a VGA driver, and Air Series software version 3.0, you need to make the following change:

1. **Make sure the Air Series Setup disk is *not* read-only.**
2. **Place the disk in drive A.**
3. **Type the following at the DOS prompt:**

```
A: <return>
MOVE SETUP.BMP SETUP.OLD <return>
COPY C:\WINDOWS\RIVETS.BMP A:SETUP.BMP <return>
```

To install Air Series from Windows:

1 **Install the NetWare client software.**

For more information, see "Installing NetWare Client Software" earlier in this appendix.

2 **Run the Air Series installation program.**

During installation, select the option to install "Air Series applications (using existing TCP/IP transport)." If you are not using this option, make sure that MACODI.COM is in your \AIR\BIN directory and that your AUTOEXEC.BAT file contains the following:

```
C:\AIR\BIN\MACODI
```

3 **Refer to "Running the Network Protocol Setup (SETNET) Utility" near the end of this appendix and follow the instructions there.**

- If you are are on a NetWare local area network and you're using the Novell VLM redirector, these lines should appear in this order:

```
REM CALL C:\NWCLIENT\STARTNET.BAT
C:\AIR\BIN\TCPIP
C:\NWCLIENT\VLM
```

- If you are using NETx, these lines should appear in this order:

```
C:\NWCLIENT\VLM
C:\AIR\BIN\TCPIP
```

Installing AppleShare for Windows in Windows for Workgroups

This section describes how to install and set up the AppleShare for Windows protocol for use with an ODI driver in Windows for Workgroups.

1 **Install the NetWare client software.**

For more information, see "Installing NetWare Client Software" earlier in this appendix.

2 **Install AppleShare for Windows according to the instructions that came with it.**

3 **Refer to "Running the Network Protocol Setup (SETNET) Utility" near the end of this appendix and follow the instructions there.**

4 After running SETNET, make sure your configuration files contain the following sections.

These sections assume no other network software is installed.

NET.CFG (with ODI support installed)

```
LINK SUPPORT
     BUFFERS 10 628
     MEMPOOL 16K

PROTOCOL APPLETALK
     DEFAULT MACODI #1
     AARP MACODI #1  H(0001) L(6) B(090007FFFFFF)

LINK DRIVER MACODI
     INT #1 10
     PORT #1 300 0
     FRAME ETHERNET_SNAP
     FRAME ETHERNET_802.3
     PROTOCOL IPX 0 ETHERNET_802.3
     PROTOCOL APPLETALK 80007809B ETHERNET_SNAP
     PROTOCOL AARP 80F3 ETHERNET_SNAP
```

ATDRIVER.BAT (with ODI support installed)

```
C:\APPLE\A_SHARE\LSL.COM
C:\APPLE\A_SHARE\MACODI.COM
C:\APPLE\A_SHARE\ODI.EXE
```

If you install a NetWare client after the AppleShare client, make sure that IPXODI and VLM are loaded after ATDRIVER.BAT in the NET.CFG file.

Installing Novell's LAN WorkPlace for DOS TCP/IP software

This section describes how to set up the LAN WorkPlace for DOS TCP/IP protocol for use with an ODI driver.

Follow these steps to install LAN WorkPlace for DOS.

1 **Install the NetWare client software.**

For more information, see "Installing NetWare Client Software" earlier in this appendix.

2 **Run the installer for LAN WorkPlace for DOS and follow the instructions on the screen.**

Let it modify your files.

3 **Make sure your NET.CFG file contains the following:**

Enter the appropriate addresses for your network configuration. Here are samples for both DOS/Windows and Windows for Workgroups.

NET.CFG (for DOS/Windows)

```
LINK DRIVER MACODI
   FRAME ETHERNET_802.2
   FRAME ETHERNET_II
   PROTOCOL IPX E0 ETHERNET_802.2
   PROTOCOL IP 800 ETHERNET_II
   PROTOCOL ARP 806 ETHERNET_II

LINK SUPPORT
   BUFFERS 8 1500
   MEMPOOL 4096

PROTOCOL TCPIP
   PATH SCRIPT      C:\NET\SCRIPT
   PATH PROFILE     C:\NET\PROFILE
   PATH LWP_CFG     C:\NET\HSTACC
   PATH TCP_CFG     C:\NET\TCP
   IP_ROUTER        X.X.X.X
   IP_NETMASK       X.X.X.X
   IP_ADDRESS       X.X.X.X
```

Your network administrator can provide the correct numbers to enter for IP_ROUTER, IP_NETMASK, and IP_ADDRESS.

NET.CFG (Windows for Workgroups)

```
LINK DRIVER MACODI
   FRAME ETHERNET_II
   FRAME ETHERNET_802.2
   FRAME ETHERNET_802.3
   FRAME ETHERNET_SNAP
   PROTOCOL IPX E0 ETHERNET_802.2
   PROTOCOL IP 800 ETHERNET_II
   PROTOCOL ARP 806 ETHERNET_II
LINK SUPPORT
   BUFFERS 8 1500
   MEMPOOL 4096
PROTOCOL TCPIP
   PATH SCRIPT      C:\NET\SCRIPT
   PATH PROFILE     C:\NET\PROFILE
   PATH LWP_CFG     C:\NET\HSTACC
   PATH TCP_CFG     C:\NET\TCP
   IP_ROUTER        X.X.X.X
   IP_NETMASK       X.X.X.X
   IP_ADDRESS       X.X.X.X
```

Your network administrator can provide the correct numbers to enter for IP_ROUTER, IP_NETMASK, and IP_ADDRESS.

LAN WorkPlace for DOS adds the following line to the AUTOEXEC.BAT file:

```
CALL C:\LANWP.BAT
```

This command asks if you want to load the TCP/IP transport file, then loads it if you answer Yes. The transport file is is called TCPIP.EXE and is located in the directory C:\NET\BIN.

Edit the \NET\BIN\LANWP.BAT file so that the following line appears after `lsl.com` and before `tcpip.exe`:

```
c:\apple\macodi.com
```

Installing protocols for use with Network Driver Interface Specification (NDIS) 2.0

Installing NetBEUI and IPX/SPX in Windows 95

This section describes how to set up the NetBEUI and IPX/SPX protocols for use with an NDIS driver in Windows 95. If you are using ODI, refer to this topic in "Installing Protocols for Use With ODI" earlier in this appendix.

1. **In Windows 95, select Start, and then select Settings.**
2. **Select Control Panel; then double-click the Network icon to open it.**
3. **Select Add; then select Adapter.**
4. **Select Have Disk.**
5. **Insert the floppy disk containing the NDIS 2.0 driver. Verify the drive; then click OK.**
6. **You see the message "PC Card Network Driver (NDIS2)." Click OK.**

   The following network items will be automatically installed:

   - Client for Microsoft Networks
   - Client for NetWare Networks
   - PC Card Network Driver (NDIS2)
   - IPX/SPX-compatible Protocol
   - NetBEUI

7. **Perform any custom setting that you need (for example, enable file sharing).**
8. **Select Identification. Fill in the boxes labeled "Computer name," "Workgroup," and "Computer Description." Then click OK.**
9. **Insert the Windows 95 CD or floppy disks as instructed.**

   Windows 95 will install all the necessary network components.

10. **Refer to "Running the Network Protocol Setup (SETNET) Utility" near the end of this appendix and follow the instructions there.**

11 **After running SETNET, make sure your PROTOCOL.INI file contains the following:**

PROTOCOL.INI

```
[NDISHLP$]
   DRIVERNAME=NDISHLP$
   BINDINGS=MACNDIS$

[PROTMAN$]
   DRIVERNAME=PROTMAN$
   PRIORITY=NDISHLP$

[DATA]
   VERSION=V4.00.950
   NETCARDS=MACNDIS$,MACNDIS

[NETBEUI$]
   DRIVERNAME=NETBEUI$
   LANABASE=0
   SESSIONS=10
   NCBS=12
   BINDINGS=MACNDIS$

[NWLINK$]
   DRIVERNAME=NWLINK$
   FRAME_TYPE=4
   CACHESIZE=0
   BINDINGS=MACNDIS$

[MACNDIS$]
   DRIVERNAME=MACNDIS$
   PROTOCOLDOT2="F0,E0,FF"
```

12 **Shut down Windows 95.**

13 **Switch to the Mac OS by typing ⌘-Return.**

14 **Click Restart PC in the PC Setup control panel.**

Installing Microsoft TCP/IP-32 IP protocol stack and IPX/SPX in Windows 95

This section describes how to set up the Microsoft TCP/IP-32 IP and IPX/SPX protocols for use with an NDIS driver in Windows 95.

This section assumes that you are installing only the Microsoft TCP/IP protocol. If you want to install additional protocols, you must modify the PROTOCOL.INI file accordingly. The Apple Network Setup Utility included with your PC Compatibility Card can add this information for you.

1. **Start Windows 95.**
2. **Select Start, and then select Settings.**
3. **Select Control Panel; then double-click the Network icon to open it.**
4. **Select Add; then select Adapter.**
5. **Select Have Disk.**
6. **Insert the floppy disk containing the NDIS 2.0 driver. Verify the drive; then click OK.**
7. **You will see the message "PC Card Network Driver (NDIS2)." Click OK.**

   The following network items will be automatically installed:

   - Client for Microsoft Networks
   - Client for NetWare Networks
   - PC Card Network Driver (NDIS 2.0)
   - IPX/SPX-compatible Protocol
   - NetBEUI

8. **Perform any custom setting that you need (for example, enable file sharing).**

   If you want to intall the TCP/IP protocol only, then remove the other protocols after you have installed the TCP/IP protocol stack first.

9. **Cick Add, then Protocol and click Add. Under Manufacturers, select Microsoft. Under the Network Protocols, double-click on TCP/IP.**
10. **Enter all the nessarry information to configure the TCP/IP stack. Double-click on TCP/IP protocol under the "PC Card Network Driver (NDIS2)" and enter the necessary info.**

11 **Refer to "Running the Network Protocol Setup (SETNET) Utility" near the end of this appendix and follow the instructions there.**

12 **After running SETNET, make sure your PROTOCOL.INI file contains the following (assuming TCP/IP is the only loaded protocol):**

PROTOCOL.INI

```
[ndishlp$]
   DriverName=ndishlp$
   Bindings=MacNDIS$
[protman$]
   DriverName=protman$
   priority=ndishlp$
[data]
   version=v4.00.950
   netcards=MacNDIS$,MacNDIS
[MacNDIS$]
   DriverName=MacNDIS$
   ProtocolDIX="800,806,8035"
```

13 **Shut down Windows 95.**

14 **Switch to the Mac OS by typing ⌘-Return.**

15 **Click Restart PC in the PC Setup control panel.**

Installing NetBEUI and IPX/SPX in Windows for Workgroups

This section describes how to set up the NetBEUI and IPX/SPX protocols for use with an NDIS driver in Windows for Workgroups. If you are using ODI, refer to this topic in "Installing Protocols for Use With ODI" earlier in this appendix.

If you want to install additional protocols, you must modify the PROTOCOL.INI file accordingly. The Apple Network Setup Utility included with your PC Compatibility Card can add this information for you.

1 **In Windows, open the Network group and select Network Setup.**

2 **Select Networks, and then select "Install Microsoft Windows Network"; then click OK.**

3. **Click Drivers; then click Add Adapters.**

4. **Select "Unlisted or Updated Network Adapter."**

5. **Insert the floppy disk containing the NDIS 2.0 driver. Verify the drive; then click OK.**

6. **You'll see the message "PC Card Network Driver (NDIS2)." Click OK.**

7. **Click Close; then click OK.**

8. **Fill in the boxes labeled "User name," "Workgroup," and "Computer Name." Then click OK.**

9. **Refer to "Running the Network Protocol Setup (SETNET) Utility" near the end of this appendix and follow the instructions there.**

10. **After running SETNET, make sure your PROTOCOL.INI file contains the following lines:**

```
[NETWORK.SETUP]
   VERSION=0X3110
   NETCARD=MACNDIS,1,MACNDIS,1
   TRANSPORT=MS$NDISHLP,MS$NDISHLP
   TRANSPORT=MS$NETBEUI,NETBEUI
   LANA0=MACNDIS,1,MS$NETBEUI
   LANA1=MACNDIS,1,MS$NDISHLP

[PROTMAN]
   DRIVERNAME=PROTMAN$
   PRIORITY=MS$NDISHLP

[MACNDIS]
   DRIVERNAME=MACNDIS$
   PROTOCOLDOT2="F0,E0,FF"

[MS$NDISHLP]
   DRIVERNAME=NDISHLP$
   BINDINGS=MACNDIS
```

11. **Exit Windows.**

12. **Switch to the Mac OS by typing ⌘-Return.**

13. **Click Restart PC in the PC Setup control panel.**

Installing Microsoft's TCP/IP in Windows for Workgroups

This section describes how to set up the Microsoft TCP/IP protocol for use with an NDIS driver in Windows for Workgroups. If you are using ODI, refer to this topic in "Installing Protocols for Use With ODI" earlier in this appendix.

1. **In Windows, open the Network group and double-click the Network Setup icon.**
2. **Select Networks, select Install Microsoft Windows Network, and then click OK.**
3. **Click Drivers; then click Add Adapters.**
4. **Select Unlisted or Updated Network Adapter and then click OK.**
5. **Insert the floppy disk containing the NDIS 2.0 driver. Verify the drive and then click OK.**

   You see the message, "PC Card Network Driver (NDIS2)."
6. **Click OK.**
7. **Click Add Protocol**
8. **Double-click Unlisted or Updated Protocol.**
9. **Enter the path to where the MS TCP/IP stack is located and click OK.**
10. **Click Close, and then click OK.**
11. **Fill in the User name, Workgroup, and Computer Name text boxes. Then click OK.**
12. **Follow the instructions on screen to complete the installation.**
13. **Refer to "Running the Network Protocol Setup (SETNET) Utility" near the end of this appendix and follow the instructions there.**
14. **After running SETNET, make sure the PROTOCOL.INI file contains the following lines:**

    PROTOCOL.INI

```
[network.setup]
version=0x3110
netcard=MacNDIS,1,MACNDIS,1
transport=ms$ndishlp,MS$NDISHLP
transport=tcpip-32r,MSTCP32
lana0=MacNDIS,1,ms$ndishlp
lana1=MacNDIS,1,tcpip-32r
```

```
[protman]
DriverName=PROTMAN$
PRIORITY=MS$NDISHLP

[MACNDIS]
DriverName=MacNDIS$
ProtocolDot2="FF,F0,E0"
ProtocolDIX="800,806,8035"

[MS$NDISHLP]
DriverName=ndishlp$
BINDINGS=MACNDIS

[MSTCP32]
BINDINGS=MACNDIS
LANABASE=0
```

Using an OS/2 LAN Server with Windows for Workgroups

To set up Windows for Workgroups to run on an OS/2 LAN Server, follow these steps:

1. **Make sure you have an account on the OS/2 LAN server, and that NETBUI is loaded and functioning.**

   If you are not sure, ask your system administrator.

2. **Open the Main group, double-click the Control Panel icon, and then double-click the Network icon.**

3. **In the Workgroup text box, assign your computer to the same workgroup that contains the OS/2 LAN Server.**

   If you wish, add your user name on the LAN Server in the Default Logon Name text box.

4. **Restart the PC.**

   Next time you start Windows, you can log on using the user name assigned to you in the OS/2 LAN Server group.

Installing client software for an OS/2 LAN server in DOS or Windows

Follow these steps to install the OS/2 LAN Server protocol for use with an NDIS driver in DOS or Windows.

IMPORTANT Do not use these instructions for installing the OS/2 client in Windows for Workgroups. Doing so may create problems with your network. For more information, see the previous section, "Using an OS/2 LAN Server With Windows for Workgroups."

1. **Create three installation floppies from the OS/2 LAN Server CD.**
2. **Insert floppy 1 in the disk drive. Type the following:**

   ```
   A:\INSTALL <enter>
   ```

3. **Verify the pathname for the installation and press Enter.**

   The default path is C:\NET.

4. **In the list of network cards that appears, select "Network card not shown in list below"; then press Enter.**
5. **Eject the disk and insert the floppy disk containing the NDIS2 driver. Press Enter twice.**
6. **Insert Disk 1 again; then press Enter.**
7. **Enter a machine name, user name, and domain name.**
8. **Follow the instructions on screen to finish the installation**
9. **Restart the PC.**
10. **Make sure your files contain the following lines:**

    PROTOCOL.INI

    ```
    [network.setup]
    version=0x3100
    netcard=MacNDIS,1,MACNDIS
    transport=ibm$netbeui,IBM$NETBEUI
    lana0=MacNDIS,1,ibm$netbeui

    [protman]
    DriverName=PROTMAN$
    PRIORITY=ibm$NETBEUI
    ```

```
[MACNDIS]
DriverName=MacNDIS$
ProtocolDot2=F0

[IBM$NETBEUI]
DriverName=netbeui$
SESSIONS=20
NCBS=20
BINDINGS=MACNDIS
LANABASE=0
```

CONFIG.SYS (the lines must be in this order)

```
DEVICE=C:\NET\PROTMAN.DOS /I:C:\NET
DEVICE=C:\NET\MACNDIS.DOS
DEVICE=C:\NET\DLSHELP.SYS
```

AUTOEXEC.BAT (the lines must be at the end of the file)

```
SHARE
C:\NET\NET START
```

NETWORK.INI

```
[NETWORK]
COMPUTERNAME=<name you specified>
LANROOT=C:\NET
AUTOSTART=FULL
GUICONFIG=0,0,1
USERNAME=<name you specified>
DOMAIN=<name you specified>
LSLOGON=YES
RECONNECT=YES
PASSWORDCACHING=YES

[PASSWORD LISTS]
username=C:\NET\username.PWL
```

Note: You can use the NETGUI command for Graphical DOS Network management work. You can also use Windows if you have installed the necessary Windows files.

If you have problems with OS/2 networking, please contact IBM.

Installing Banyan Vines in DOS

This section describes the settings you must make when using Banyan Vines with an NDIS driver in DOS. Refer to the documentation that came with Windows for Workgroups for other installation instructions.

1. **Install the Banyan Vines client software.**

2. **Make sure your configuration files contain the following:**

   CONFIG.SYS

   ```
   REM *** BANYAN ***
   DEVICE=C:\BANYAN\PROTMAN.DOS /I:C:\BANYAN
   DEVICE=C:\BANYAN\MACNDIS.DOS
   ```

   PROTOCOL.INI (in the directory where the Banyan software is installed)

   ```
   [VINES_NIF]
   DRIVERNAME=NDISBAN$
   BINDINGS=MACNDIS

   [MACNDIS]
   DRIVERNAME=MACNDIS$
   PROTOCOLDIX=BAD
   ```

Installing NetManage Chameleon TCP/IP software in Windows for Workgroups

This section describes the steps necessary to install the NetManage Chameleon TCP/IP protocol for use with the either an ODI or NDIS driver in Windows for Workgroups.

If you are using an ODI-compatible protocol, be sure to install the Novel NetWare client software first. See "Installing NetWare Client Software" earlier in this appendix.

1. **Run the Chameleon/NFS installer and follow the instructions in the NetManage manual and on screen.**

2. **Refer to "Running the Network Protocol Setup (SETNET) Utility" near the end of this appendix and follow the instructions there.**

3 **After running SETNET, make sure your files include the following entries:**

AUTOEXEC.BAT

```
C:\NETMANAG\NMODI
```

NET.CFG

```
LINK DRIVER MACODI
   FRAME ETHERNET_802.2
   FRAME ETHERNET_II
   PROTOCOL IP 800 ETHERNET_II
   PROTOCOL ARP 806 ETHERNET_II
   PROTOCOL RARP 8035 ETHERNET_II
```

Using a dial-up service

If you are using a dial-up service, you may need to edit the configuration file to conform to your service's setup options. Click the Custom icon in Windows, open the appropriate .CFG file, and edit the file.

Running the Network Protocol Setup (SETNET) utility

A PC-compatible Macintosh allows you to connect to more than one network at a time, one in the PC environment and one in the Mac OS environment. The Network Protocol Setup (SETNET) utility helps configure your PC networking setup files (such as NET.CFG and PROTOCOL.INI) to distinguish between information sent to the network selected in the Mac OS environment and information sent to the network in the PC environment.

Before running SETNET, you must have installed network driver and protocol software according to the instuctions earlier in this appendix.

1 **In Windows 95, click Start, and choose Run from the menu that appears.**
In Windows, choose Run from the File menu.

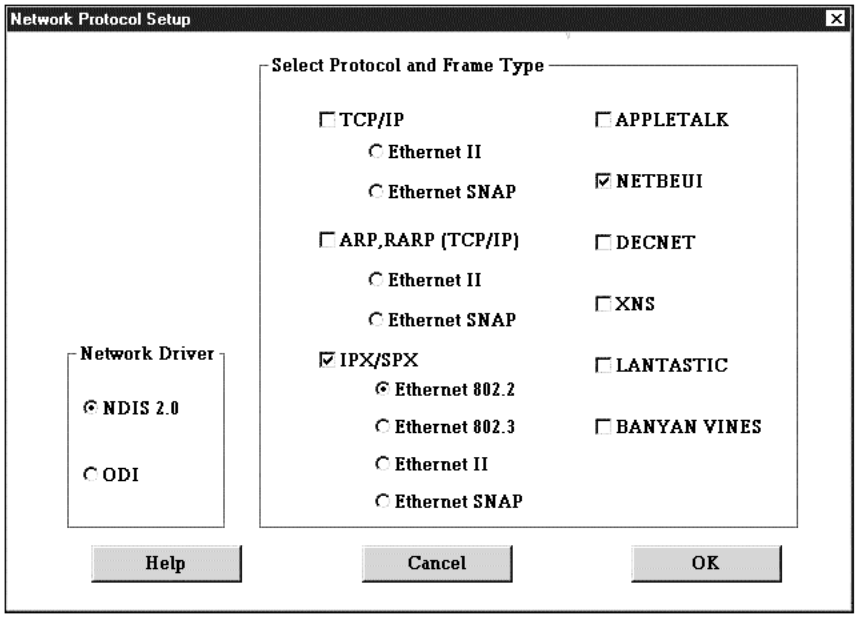
A dialog box appears.

2 **Insert the *PC Setup* floppy disk.**

3 **Type the following and then press Return:**

```
A:\SETNET.EXE
```

The Network Protocol Setup dialog box appears.



You should not need to select an option in the Network Driver area. The SETNET utility automatically detects the network driver you installed.

4 **Select one or more network protocols that you installed by clicking checkboxes in the "Select Protocol and Frame Type" area.**

You can select more than one protocol if you have installed more than one. If you are only using one protocol, be sure to turn on its checkbox and leave the other checkboxes turned off.

5 **If you are using TCP/IP, ARP, RARP (TCP/IP), or IPX/SPX, select the appropriate frame type for each selected protocol by clicking radio buttons in the Select Protocol and Frame Type area.**

6 **Click OK.**

7 **Shut down or exit Windows.**

8 **Switch to the Mac OS by typing ⌘-Return.**

9 **Shut down the PC by clicking Shut Down PC in the PC Setup control panel.**

10 **Shut down the Macintosh, wait ten seconds, and start up the Macintosh again.**

You need to shut down the Macintosh and start it up again to make sure that the network software is installed properly.

IMPORTANT If you are using ODI with Windows 95, you may need to manually add the following two lines to your `PROTOCOL.INI` file after running the SETNET utility:

```
[NET.CFG]
PATH=C:\NWCLIENT\NET.CFG
```

Avoiding simultaneous networking conflicts

On any model of computer with a PC Compatibility Card, you can connect to a network in the PC environment and the Mac OS environment at the same time. However, some models of Macintosh (such as Power Macintosh 7200/70, 7200/90, 7500/100, 8500/120, 9500/120, 9500/132) do not support the use of the same network protocol in two environments simultaneously. If you have one of these models, follow these steps to avoid conflicts:

- If you want to use the IPX/SPX protocol in the PC environment, make sure there is no MacIPX control panel in the Control Panels folder, or select AppleTalk as your network interface in the MacIPX control panel.
- If you want to use the TCP protocol in the PC environment, remove MacTCP from the Control Panels folder or select an interface other than Ethernet in the MacTCP or Open Transport TCP/IP control panel.

Note: Using a procedure called tunneling, you can run the same protocol in both environments even if your computer model does not support simultaneous connections. With tunneling, you encapsulate one protocol inside a different protocol. For example, if you want to use TCP/IP in both environments, you can install a gateway to route IP encapsulated in AppleTalk or in IPX/SPX. One solution is to set MacTCP or Open Transport for EtherTalk and put an Apple IP Gateway on the network. For more information, see the manuals included with your networking software or your network administrator.

Appendix C
Configuring Video Software

This appendix describes special configuration options for the ATI video circuitry and ATI video drivers that came with your PC Compatibility Card.

About video capabilities

The PC Compatibility Card comes with ATI video circuitry and ATI mach64 graphics accelerators, providing high performance 64-bit graphics, accelerating up to 16.7 million colors (at a resolution of 800 x 600) and up to 1280 x 1024 resolution (with 256 colors). Availability of colors and resolutions depends on the monitor connected, the type of chip, and the amount of video memory installed. This appendix also describes the use of WINBOOST, which provides 64-bit graphics acceleration in multiple environments.

The video circuitry is initially configured to display basic VGA at a resolution of 640 x 480. If you have a multiple-scan monitor, you can configure the circuitry to provide the full range of resolutions and refresh rates that your monitor can support.

Your operating system may also provide utilities for installing and configuring enhanced drivers. Please refer to the documentation that came with your operating system for information.

Installing and configuring video software in Windows

For instructions on installing basic video software and selecting monitor types in Windows and Windows 95, see Chapter 4, "Installing the PC Compatibility Card Software." This section provides information about ATI DeskTop (the configuration program for Windows), configuring video in DOS, installing special display drivers and utilities for DOS, and installing MPEG video software in Windows and Windows 95.

Configuring video software in DOS

To install and configure DOS video software for a multiscan monitor, follow these steps:

1. **In the DOS environment, insert the *PC Utilities* CD into the CD-ROM drive.**

2. **Type the following:**

   ```
   CD E:\VIDEO\DRIVERS\INSTALL <enter>
   INSTALL <enter>
   ```

   The Install program's main menu appears.

3. **Select Quick Setup from the menu.**

   The Quick Setup option only appears if you have a multiscan monitor.

4. **Select your monitor in the list that appears.**

   When you select a monitor in the list, specifications for that monitor are displayed in the info box. If your monitor is not listed, you have several options:

   - Select VGA 640 x 480. This setting works for all monitors, but you will not be able to use multiple resolutions or refresh rates.
   - If you have a VDIF file for your monitor, insert the disk containing the file, select READ VDIF in the menu, and type the pathname of the file.

- If your monitor's specifications are the same as those of a listed monitor, choose that monitor in the list.
- If no listed monitor is similar to your monitor, select Custom to configure the circuitry manually. (Custom configuration works only with multiple-scan monitors.) For more information, see "Making Custom Monitor Settings in DOS," which follows.

5 **Exit and save your settings.**

Making custom monitor settings in DOS

If you have a multiscan monitor, you can follow these steps to select custom monitor settings for DOS.

1 **In the DOS environment, insert the *PC Utilities* CD into the CD-ROM drive.**

2 **Type the following:**

```
CD E:\VIDEO\DRIVERS\INSTALL <enter>
INSTALL <enter>
```

The Install program's main menu appears.

3 **Select Quick Setup from the menu.**

The Quick Setup option only appears if you have a multiscan monitor.

4 **Select Custom in the list that appears.**

5 **Choose a resolution, then a refresh rate.**

A box appears.

If the monitor produces a scrambled display, press the Esc key to exit and choose a lower refresh rate. If there is no lower rate to choose, set that resolution to "Not Supported."

WARNING Do not choose a refresh rate that is higher than your monitor supports. You might damage your monitor. Consult your monitor manual for specifications.

6 **To adjust screen centering for the selected resolution, change the size and position of the box; then press Enter.**

7 **Repeat steps 2–3 until you are satisfied with the screen centering for all the resolutions supported by your monitor.**

8 **Exit and save your settings.**

If you want to cancel your settings, press the Esc key and confirm as prompted.

Installing custom video drivers in DOS

The ATI software includes custom video drivers for a variety of DOS applications. To install the drivers, follow these steps:

Installing drivers for Intergraph MicroStation 4.0, 5.0

Before you begin, ensure that MicroStation is properly installed on your system.

1 **Start the Install program.**

To start the program, insert the *PC Utilities* CD into the CD-ROM drive and type:

```
CD E:\VIDEO\DRIVERS\INSTALL <enter>
INSTALL <enter>
```

The main menu appears.

2 **Select Drivers Installation from the menu.**

A list of applications appears.

3 **From the list of applications, select MicroStation.**

4 **Enter the pathname for MicroStation.**

5 **Insert the disk as prompted.**

A menu appears.

6 **Select Read Installation Notes for help and tips.**

7 **Follow instructions on the screen to complete the installation; then press the Esc key to exit.**

A MicroStation driver reference document and an information file called README.USD are copied to the MicroStation Drivers directory on your hard disk.

Installing drivers for Microsoft Word (for DOS) 5.x, 6.0

The enhanced drivers for Microsoft Word support 640x480, 800x600, and 1024x768 screen resolutions in 16 colors.

Before you begin, ensure that Word is properly installed on your system.

1 **Start the Install program.**

To start the program, insert the *PC Utilities* CD into the CD-ROM drive and type:

```
CD E:\VIDEO\DRIVERS\INSTALL <enter>
INSTALL <enter>
```

The main menu appears.

2 **Select Drivers Installation from the menu.**

A list of applications appears.

3 **Select Microsoft Word.**

4 **Select the version of Word.**

5 **Select Read Installation Notes for tips and additional details.**

6 **Follow the instructions on screen to complete the driver installation; then press the Esc key to exit.**

Refer to the README.WRD file that has been copied into your Word directory for instructions and driver configuration details.

Installing drivers for WordPerfect (for DOS) 5.1

The enhanced drivers for WordPerfect 5.1 support 800x600 and 1024x768 screen resolutions in 16 colors.

Before you begin, make sure WordPerfect is installed on your system.

1 **Start the Install program.**

To start the program, insert the *PC Utilities* CD into the CD-ROM drive and type:

```
CD E:\VIDEO\DRIVERS\INSTALL <enter>
INSTALL <enter>
```

The main menu appears.

2 **Select Drivers Installation from the menu.**

A list of applications appears.

3 **Select WordPerfect.**

4 **If prompted, insert the driver distribution disk.**

You may have to enter the source drive and directory information.

5 **Select Read Installation Notes for more information.**

6 **Select Install WordPerfect 5.x driver.**

7 **Enter the directory where WordPerfect is installed; then press Return.**

8 **When driver installation is completed, press the Esc key to exit.**

9 **Start WordPerfect and press Shift-F1 for the Setup option.**

10 **Press <D> for Display.**

11 **Press <G> for Graphics Screen Type.**

12 **Select the mach64 driver and press Return.**

Refer to the README.WP file that has been copied into your WordPerfect directory for instructions and driver configuration details.

Installing drivers for WordPerfect 6.0

Your video circuitry works with the VESA BIOS Extension, which supports several high-resolution VESA display modes. You can read additional installation notes by following steps 1–5 under the previous heading, "Installing Drivers for WordPerfect (for DOS) 5.1."

Before you begin, configure your video as described in "Configuring Video in DOS," earlier in this appendix.

1 **Start WordPerfect and press Shift-F1 for the Setup option.**

2 **Press <D> for Display.**

3 **Press <G> for Graphics Screen Type.**

4 **Press <S> for Screen Type.**

5 **Select VESA VBE (VESA BIOS Extension) and press <S>.**

6 **Select one of the displayed modes and press <S>.**

You may see a Driver Warning message. If so, consult the WordPerfect documentation for information.

7 **Press Return as prompted.**

When you exit the Setup program, you should be in the selected mode. If not, make sure you have selected the appropriate resolution.

Installing MPEG video support in Windows

Your video software includes the ATI Video Player—an MPEG player for Windows and Windows 95 that provides full-motion, full-screen color MPEG video playback. You must install the enhanced video drivers before installing the ATI Video Player.

Installing MPEG video support in Windows 95

To install the MPEG player, follow these steps:

1. **Insert the *PC Utilities* CD into the CD-ROM drive.**
2. **Select Start.**
3. **Select Run.**
4. **Type the following:**

   ```
   CD E:\VIDEO\MPEG95\SETUP
   ```

5. **Follow the setup instructions to complete the installation.**

Installing MPEG video support in Windows

The ATI Video Player uses Microsoft's Video for Windows. If Video for Windows is not installed on your system, refer to the README in the VIDEO\ATI\CD directory for more information.

1. **Start the Install program from the DOS prompt.**

   To start the program, insert the *PC Utilities* CD into the CD-ROM drive and type:

   ```
   CD E:\VIDEO\DRIVERS\INSTALL <enter>
   INSTALL <enter>
   ```

   The main menu appears.

2 **Select Drivers Installation from the menu.**

3 **Select Microsoft Windows.**

4 **Select Display Drivers + Software MPEG.**

5 **Follow the on-screen instructions.**

ATI DeskTop video configuration software for Windows

ATI DeskTop is installed automatically with the enhanced driver for Windows. The ATI DeskTop provides the following features:

- The Flexdesk+ control panel allows you to change color depth, screen size, and desktop size within Windows. (Some features are available for multiple-scan monitors only.)
- DeskScape lets you scroll across an off-screen work space of up to 1600 x 1200 (depending on how much video DRAM is installed) and allows zooming.
- WinSwitch switches display modes instantly.
- Color Correction enables you to adjust screen color to match printed copy.
- Screen Adjustment lets you adjust the screen size, centering, and monitor configuration (multiple-scan monitors only).
- Windows Motion Video Acceleration (MVA) enhances Indeo and QuickTime. MVA uses an image smoothing technique that stretches an image to a larger, more usable size while eliminating pixel blockiness.
- Context-sensitive help explains how to customize your accelerator card configurations.

Note: The DPMS energy saving feature is not supported.

Using DOS video utilities

For instructions on installing utilities, see "Configuring Video Software in DOS," earlier in this appendix.

VESA BIOS Extension

The VESA BIOS Extension (VBE) utility is a DOS TSR program called M64VBE.COM. This program supports software running on VESA modes using mach64 features. If your software and/or games conform to the VBE standard, you should load M64VBE.COM before using your software.

To load the utility, change to the directory containing the utility and type the following:

```
M64VBE <Enter>
```

To display help, type:

```
M64VBE ? <Enter>
```

To unload the utility, type:

```
M64VBE U <Enter>
```

Refer to your DOS documentation for more information about TSR programs.

DPMS for DOS

DPMS—the Display Power Management Signaling system—is not supported by the PC Compatibility Card.

Troubleshooting

Using the diagnostics utility

You can view and test any installed graphics mode at any supported resolution and color depth by running the Install program from the DOS prompt or by running a diagnostics program called M64DIAG.EXE.

Note: Do not run M64DIAG.EXE in a windowed or full-screen DOS box.

Any time you suspect there is a problem, especially during installation, you should run the above tests. The information provided in the next section, "Solutions and Explanations for Problems," will enable you to solve most problems.

To run the diagnostics utility, follow these steps:

1. **Insert the PC Utilities CD into the CD-ROM drive and type:**

   ```
   CD E:\VIDEO\DRIVERS\INSTALL <enter>
   INSTALL <enter>
   ```

   A menu appears.

2. **Select Diagnostics from the menu.**

3. **Select Test Graphics Adapter.**

4. **Select the test you wish to run.**

   You can select either VGA Tests or Accelerator Tests. Problems and solutions for some common errors found by the test program are provided in the next section, "Solutions and Explanations for Problems."

Solutions and explanations for problems

This section describes several checks and tests you can perform to help diagnose problems with your video circuitry. In some cases you can fix the problem yourself; in other cases you may need to consult a specialist.

System is locked up.

If your system is not responding, try the following:

- Make sure the software is installed properly.
- Reset the video configuration to factory defaults using the Install program. If this works, the problem is likely due to incorrect configuration.

Test patterns are OK but applications do not sync.

You may have selected the wrong monitor type. Change the settings in the Install program.

Windows driver is not installing properly.

Make sure Windows is running in 386 Enhanced Mode. Incompatible memory managers may prevent Windows from starting in enhanced mode. If this occurs, remove the memory manager.

AutoCAD driver is not installing properly.

If using a 386 processor, ensure that AutoCAD has been configured for the appropriate ADI driver. The protected mode driver requires extended memory.

Memory aperture test fails, diagnostics program locks, or the computer restarts during aperture test.

If you see a message that the memory aperture location is conflicting with your system memory, restart the Install program as follows:

```
INSTALL APMAP <Enter>
```

Enable Memory Aperture, selecting a location above but not overlapping System Memory (S), BIOS (B), or Reserved (R) locations.

The resolution I want is not available (dimmed).

The BIOS has been instructed that the mode is not available. If you're sure your monitor supports the resolution, run the Install program again and use the custom configuration option.

A menu item is not available (dimmed).

The mode or test is not available for the current configuration. For example, aperture tests are not available if the aperture is turned off. CRT mode and pixel depth are determined by the current installation, DAC type, memory size, and memory type.

A FIFO test error occurred.

The effects of a bad command FIFO should be visible (for example, the display may be blank or there may be "garbage" on the screen).

A quick memory test error occurred.

Run the Detailed RAM Test to confirm the error and identify the address of the error.

A detailed memory test error occurred.

Run the Detailed RAM Test several times to confirm the error. Take note of any messages and error codes that are displayed.

The DAC LUT test failed.

An error occurred while testing the DAC LookUp Table. The problem should be visible on the top color bar of any 8 bpp mode.

A ROM checksum error occurred.

An error was detected in the ROM.

The draw sequence failed.

An error occurred in the draw engine. If the error is intermittent, there may be a marginal RAM failure. The effects of this failure may not be immediately apparent.

Video mode tables

This section describes the video mode specifications for ATI video drivers using DRAM.

When discussing color depth, 8 bits per pixel (8 bpp) is the same as 256 colors. Therefore, the relation between bpp and colors is as follows:

Bits per pixel	Number of colors
8	256
16	65,000
24	16,700,000

The ATI video drivers also support 15 bpp (32,000 colors). Any resolution and refresh settings that support 16 bpp will support 15 bpp.

DRAM accelerator mode (WINBOOST)

The following table lists color depths and other features supported at various monitor resolutions in graphics mode. The settings listed in this table can be applied to multiple-scan monitors only.

Resolution	Refresh rate (Hz)	Horizontal frequency (kHz)	Pixel clock (MHz)	Maximum color depth (bpp)*
640 x 480	60	31.4	25.2	24, 32†
	72	37.7	31.2	24, 32
	75	37.5	31.5	24, 32
	90	47.9	39.9	16, 24
	100	52.9	44.9	16, 16

continued ▶

Resolution	Refresh rate (Hz)	Horizontal frequency (kHz)	Pixel clock (MHz)	Maximum color depth (bpp)* *(continued)*
800 x 600	48 interlaced	33.8	36.0	16, 24
	56	35.1	36.0	16, 24
	60	37.8	40.0	16, 24
	70	44.5	44.9	16, 16
	72	48.0	50.0	16, 16
	75	46.8	49.5	16, 16
	90	57.0	56.6	8, 8
	100	62.5	67.5	8, 8
1024 x 768	43 interlaced	35.5	44.9	8, 16
	60	48.3	65.0	8, 16
	70	56.4	75.0	8, 16
	72	58.2	75.0	8, 16
	75	60.0	78.8	8, 16
	90	76.2	100	—, 8
	100	79.0	110	—, 8
1152 x 864	43 interlaced	45.9	65.0	8, 8
	47 interlaced	44.8	65.0	8, 8
	60	54.9	80.0	8, 8
	70	66.1	100	—, 8
	75	75.1	110	—, 8
	80	75.1	110	—, 8

continued ▶

Resolution	Refresh rate (Hz)	Horizontal frequency (kHz)	Pixel clock (MHz)	Maximum color depth (bpp)* *(continued)*
1280 x 1024	43 interlaced	50.0	80.0	—, 8
	47 interlaced	50.0	80.0	—, 8
	60	63.9	110	—, 8
	70	74.6	126	—, 8
	74	78.8	135	—, 8
	75	79.9	135	—, 8

*In the max color depth column, the first number is the bits per pixel supported at 1 MB DRAM, the second number is the bits per pixel supported at 2 MB DRAM. — means the color depth is not supported in that DRAM configuration.

†32 is 24 bpp color data processed using a 32 bpp data format.

VESA BIOS Extension modes

The VESA BIOS Extension supports the following modes in multiple-scan monitors. To determine which modes you can use with your monitor, run the VESATEST utility.

Resolution	Maximum color depth (bpp)	Graphics mode	Minimum DRAM
640 x 480	8	110h, 101h	1 MB
	15 (5:5:5)	110h	1 MB
	16 (5:6:5)	111h	1 MB
	24 (8:8:8)	112h	1 MB
800 x 600	4	102h, 6Ah	1 MB
	8	103h	1 MB
	15 (5:5:5)	113h	1 MB
	16 (5:6:5)	114h	1 MB
1024 x 768	4	104h	1 MB
	8	105h	1 MB
	15 (5:5:5)	116h	2 MB
	16 (5:6:5)	117h	2 MB

Fixed-frequency monitors

The following tables list the resolutions supported on fixed-frequency (non-multiple-scan) monitors. The color depths for 1 MB and 2 MB of DRAM are also listed. You cannot change refresh rate and other timing items for fixed-frequency monitors.

Macintosh 21-Inch Color Display

Refresh rate: 68.7 KHz (horizontal), 75.08 Hz (vertical)

	Color depth	
Resolution	**1 MB**	**2 MB**
640 x 400	16 bpp	16 bpp
640 x 480	16 bpp	16 bpp
800 x 600	8 bpp	8 bpp
1024 x 768	not supported	8 bpp

Macintosh 21-Inch Monochrome Display

Refresh rate: 68.7 KHz (horizontal), 75.08 Hz (vertical)

	Color depth	
Resolution	**1 MB**	**2 MB**
640 x 400	16 bpp	16 bpp
640 x 480	16 bpp	16 bpp
800 x 600	8 bpp	8 bpp
1024 x 768	not supported	8 bpp

19-Inch Color Display

Refresh rate: 60.2 KHz (horizontal), 74.9 Hz (vertical)

Resolution	Color depth 1 MB	2 MB
640 x 400	16 bpp	16 bpp
640 x 480	16 bpp	16 bpp
800 x 600	8 bpp	8 bpp
1024 x 768	8 bpp	16 bpp

Macintosh 16-Inch Color Display

Refresh rate: 49.7 KHz (horizontal), 74.55 Hz (vertical)

Resolution	Color depth 1 MB	2 MB
640 x 400	16 bpp	16 bpp
640 x 480	16 bpp	16 bpp
800 x 600	8 bpp	8 bpp

Macintosh Portrait Display (monochrome)

Refresh rate: 68.7 KHz (horizontal), 75.08 Hz (vertical)

Resolution	Color depth 1 MB	2 MB
640 x 400	16 bpp	16 bpp
640 x 480	16 bpp	16 bpp

Macintosh 12-Inch Monochrome Display, 13-Inch Color Display, 14-Inch Color Display, and AudioVision Display

Refresh rate: 35 KHz (horizontal), 66.67 Hz(vertical)

Resolution	Color depth 1 MB	2 MB
640 x 400	16 bpp	16 bpp
640 x 400	24 bpp	32 bpp
640 x 480	24 bpp	32 bpp

User-adjustable monitors

The following monitor types accept additional modes and display customization. You can customize monitors using the Install program, the ATI DeskTop program, or the Windows 95 Display control panel. You can add modes either by selecting a predefined monitor type or by manually selecting a set of modes. Consult the specifications for your monitor to ensure that it supports the mode you want.

- VGA/SVGA
- Apple Multiple Scan 15 Display
- Apple Multiple Scan 17 Display
- Apple Multiple Scan 1705 Display
- Apple Multiple Scan 20 Display
- AppleVision 1710 Display
- AppleVision 1710AV Display
- DDC 1 /2B monitor

Appendix D
Technical Information

General specifications

Description

- 7-inch PC-compatible PCI card

System

- 5x86 microprocessor
- 128K L2 cache
- Plug-n-Play BIOS

Power

- +5 volts, ±12 volts
- 10 watts maximum

Expansion RAM

- socket for one 168-pin DIMM 70 ns or less; expandable to 64 MB.

Note: 16 MB or greater DIMMs must have the configuration 256K x 64, 1 MB x 64, 2 MB x 64, or 4 MB x 64. DIMMs with a 4K refresh rate will not work.

Networking

- supports ODI and NDIS v.2.1 network drivers
- supports IPX/SPX, NetBEUI, AppleTalk, and TCP/IP protocols in the PC environment

Sound

16-bit Sound Blaster sound system (with some card models only) allows:

- PC sound played through Macintosh speaker or headphones
- CD-ROM sound recording capability (some computer models only)
- enhanced FM-synthesized sound-out capabilities
- 8- and 16-bit digital sound

Keyboard

- Macintosh ADB keyboard and mouse emulate PC AT-compatible keyboard and PS/2-compatible mouse

Joystick

- standard PC-style joysticks supported through DB-15 connector included on some models of the card (PC applications only)

MIDI

- MIDI devices supported through a Sound Blaster–compatible joystick-to-MIDI adapter cable (available separately)

Serial ports

- two PC-compatible (RS-232) serial interfaces that can be routed, under software control, either to a text file or through the two Macintosh RS-422 serial ports (RS-422 ports do not support all RS-232 signals)

Parallel port

- Macintosh printer port can emulate PC XT/AT-compatible parallel port (LPT1)

Video specifications

Video modes

- VGA modes 0-7 and D-13h
- SVGA modes for 640x480 and 800x600 (79h, 6Ah, 70h)
- VESA 2.0 support in BIOS
- supports 13-, 14-, 16-, and 20-inch Macintosh-compatible monitors; Macintosh Portrait Display monitors; Macintosh Two-Page Display monitors; and 15-, 17-, and 20-inch Macintosh multiple scan monitors
- supports all VGA monitors
- EGA, CGA, MDA also supported
- 1 MB video DRAM

Sync signals

- separate horizontal, composite, and vertical sync at TTL levels

Power

- +5V ±5%, @ 1.3A typical

Environment

Temperature

- Operating: 10° C to 40° C (50° F to 104° F)
- Non-operating: –40° C to 65° C (–40° F to 149° F) for 72 hours

Relative humidity

- Operating: 10% RH to 90% noncondensing
- Non-operating: 5% RH to 95% noncondensing

Altitude

- Operating: -1,000 to 10,000 feet (-304.8 m to 3,048 m)
- Non-operating: -1,000 to 40,000 feet (-304.8 m to 12,192 m)

If you can't find what you're looking for in this index, look in Macintosh Guide—available in the Guide (?) menu on your computer.

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